



**Taylor & Mulder**  
Property and Casualty Consulting Actuaries

**MISSOURI PETROLEUM STORAGE TANK INSURANCE  
FUND**

**LOSS AND LOSS ADJUSTMENT EXPENSE  
RESERVE ANALYSIS  
AS OF JUNE 30, 2016**

**AUGUST 2016**

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August 19, 2016

Ms. Carol Eighmey  
Executive Director  
Petroleum Storage Tank Insurance Fund  
P.O. Box 836  
Jefferson City, MO 65102

**RE: ACTUARIAL ANALYSIS OF THE PETROLEUM STORAGE TANK INSURANCE FUND  
AS OF JUNE 30, 2016**

Dear Ms. Eighmey:

Enclosed is the actuarial review of the loss and allocated loss adjustment expense reserves of the Missouri Petroleum Storage Tank Insurance Fund as of June 30, 2016.

The first section in the text of our report is the Executive Summary section. This section presents our conclusions and recommendations. It also describes the purpose and scope of our report, explains the distribution and use of our report, and provides the conditions and limitations underlying our work. This section of our report includes the Background section which provides information about the PSTIF program history.

The next section of the text of our report is the Actuarial Analysis section that describes the sources of data, our overall methodology, the selection of factors and specific methodologies and considerations by line of business. It also describes the selection of ultimate losses, and loss reserve discounting. The Exhibits section of our report follows the text of the report and includes all of our analyses.

Please feel free to call if you have any questions regarding any aspect of our report.

Sincerely,

Jane C. Taylor, FCAS, MAAA, JD

Daniel W. Lupton, FCAS, MAAA, MBA  
Enclosures

# **Missouri Petroleum Storage Tank Insurance Fund Loss and Loss Adjustment Expense Reserve Analysis as of June 30, 2016**

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## **Executive Summary**

### **Purpose and Scope**

Taylor & Mulder, Incorporated (“T&M”) was requested by Missouri Petroleum Storage Tank Insurance Fund (“PSTIF”) to conduct an actuarial review of its loss and loss adjustment expenses reserves as of June 30, 2016. This report contains our summary, conclusions and recommendations along with a description of the analysis underlying our conclusions.

Specifically, T&M was asked by the PSTIF to conduct an actuarial analysis to include within its scope the following tasks:

- A review and opinion on the adequacy of current claim reserves,
- A projection of future claim liabilities, including an estimate on future claim severity and frequency, separately for each claim type, and
- An analysis of large loss claims, including:
  - Information on the typical lag time between the time when a claim is opened and the time it is identified as a “large loss claim,”
  - The history of losses and reserving practices on “large loss claims,” and
  - Information on how “large loss claims” are expected to impact the PSTIF’s future finances.

This report presents the results of those analyses. This report was prepared by Jane C. Taylor, FCAS, MAAA, Principal and Consulting Actuary and Daniel W. Lupton, FCAS, MAAA, MBA, Vice President and Consulting Actuary.

In accordance with the requirements of the Actuarial Standards of Practice in making statements of actuarial opinion, I provide the following statement:

*I, Jane C. Taylor, am Principal and Consulting Actuary in the firm of Taylor & Mulder, Inc. I am a Fellow of the Casualty Actuarial Society in good standing and qualified to issue a Statement of Actuarial Opinion. I am also a Member of the American Academy of Actuaries.*

## **Background**

In the early 1980s, the federal government recognized that an underground storage tank (“UST”) could present an environmental hazard. At the time, many underground petroleum tanks were fabricated of unprotected steel which was subject to corrosion and deterioration leading to contamination of the surrounding soil and, perhaps more importantly, nearby groundwater. By 1984, legislation was in place to permit the Environmental Protection Agency (“EPA”) to set standards for tank design, installation, and protection to minimize the danger of future releases of petroleum or other hazardous chemicals stored underground. Over the years since, there have been additional EPA standards and regulations for tanks to further strengthen measures to protect the environment and groundwater. Included in these rules are requirements for tank owners/operators to have minimum levels of financial resources to deal with leaks and spills that might occur. This financial requirement is generally met by the purchase of insurance, either commercially or through the PSTIF.

Under the current federal guidelines for tanks and the requirements of the Missouri Department of Natural Resources (“DNR”) for tank construction and installation, most current leaks and spills were the results of failure of piping fittings and joints or the dispensing mechanisms rather than the tanks themselves. However, defective fittings or joints may still result in leaks that remain undetected for a period of time leading to ground water contamination.

Missouri responded to the federal actions and established the Petroleum Storage Tank Insurance Fund (“PSTIF”) in 1989 to assist owners/operators of underground storage tanks in meeting federal financial

responsibility rules. In 1992, the PSTIF began offering insurance to underground tank owners/operators to pay for the costs associated with petroleum leaks and spills in the state of Missouri. The policies are written on a claims-made basis.

In 1995, the Missouri mandate for protection was expanded to include cleanup of petroleum contamination from uninsured leaks and spills. Uninsured risks included operations that had been closed prior to the financial responsibility requirements and non-insured sites. Therefore, the PSTIF pays for remediation costs associated with uninsured aboveground and underground storage tanks that were taken out of use by December 31, 1997, even when the tanks were never insured by the PSTIF. In some cases, petroleum releases went undetected (for example, at old gas stations) for many years. When soil or water tests reveal petroleum contamination as a result of such disused sites and a party is identified who is willing to assume responsibility for directing remediation efforts, PSTIF will pay for the remediation associated with that leak or spill subject to certain criteria and after a deductible.

In 1996, the PSTIF was opened to aboveground storage tank (“AST”) owners/operators to voluntarily purchase protection. Then in 2008, the Missouri legislature mandated that AST owners/operators demonstrate financial responsibility for liability arising from any leak or spill beginning in 2011. This increased the number of ASTs insured by PSTIF.

Extended reporting endorsements permit the reporting of claims for a period of up to five (5) years after the tank is retired from service or sold. PSTIF began offering extended reporting endorsements for AST owners/operators taking tanks out of service in 2002. Beginning in 2004, UST owners/operators have been able to buy an extended reporting endorsement.

The initial legislation enabling the PSTIF had a sunset date of December 31, 1998. Additional legislative actions have moved the date to 2003, 2010, and finally to the current December 31, 2020 sunset date.

Consequently, all projections performed by T&M in this report assume a December 31, 2020 sunset date. PSTIF will be responsible for the cost of claims reported to it as of December 31, 2020. Claims after that date will not be handled by PSTIF without further legislation extending the sunset date.

In contrast to many such state funds, which often act more as government grant programs than insurance programs, the PSTIF requires tanks owners/operators to complete an application and be approved to receive a coverage document. The coverage document is either the Underground Storage Tank Participation Agreement or the Aboveground Storage Tank Pollution Liability Policy depending on the type of tank insured. The application and approval process allows the PSTIF to enforce compliance with ever-developing standards for tanks and the associated piping.

In the event that a leak or spill is discovered after the retroactive date of a policy (the date at which coverage initially attaches), PSTIF will pay for the first \$1,000,000 of the costs per event, subject to a \$2,000,000 annual aggregate. Each event carries a \$10,000 deductible. Coverage attaches provided that the leak is discovered after the retroactive date.

PSTIF storage tank claims are categorized into the following groups:

- Insurance UST – Release: Underground storage tank petroleum releases from insured tanks;
- Insurance UST – Closure: Underground storage tank petroleum releases from insured tanks that were discovered when the tank was being removed from an insured site;
- Insurance UST – Other: Underground storage tank petroleum releases from insured tanks that do not fit into either of the above categories;
- Remedial UST: Cleanup costs associated with remediation of uninsured underground storage tank sites that were taken out of use prior to the deadline set by the Missouri Legislature;
- Insurance AST: Aboveground storage tank petroleum spills from insured tanks, and



- Remedial AST: Cleanup costs associated with remediation of uninsured aboveground storage tank sites that were taken out of use prior to the deadline set by the Missouri Legislature.

## **Terms Defined**

**ALAE** Allocated Loss Adjustment Expense (“ALAE”) is the amount of money spent on a particular claim to the benefit of an insured, the amount that can be allocated to a single claim. These expenses include the attorneys’ fees, expert witnesses, collection and protection of material germane to the claim, etc. For the PSTIF, ALAE does not include Third Party Administrator (“TPA”) expenses.

**Claims-Made** Claims-made coverage is a type of insurance coverage that provides protection for the insured on claims reported during the policy period given that the incident giving rise to the claim occurred on or after the Retroactive Date (“retro date”). The retro date is usually the date the first claims-made policy was issued to the insured. PSTIF issues claims-made policies to its insureds.

Claims-made coverage is in contrast to occurrence coverage which responds to claims brought against the insured given that the incident giving rise to the claim occurred during the policy period. Both private passenger automobile and homeowners policies are written on an occurrence basis.

**Claim Frequency** Claim frequency is the average number of claims per insured exposure. For PSTIF, an insured exposure is one tank insured for one year. For example, if 250 claims are reported in a year with 10,000 insured tanks, the claim frequency (average number of claims per insured exposure) is  $250 / 10,000 \text{ insured tanks} = 0.025 \text{ claim per tank}$ .

**IBNR**

Incurred But Not Reported (“IBNR”), strictly speaking, is a reserve derived by actuaries for claims not as yet reported to the insurer for which premium has been earned and for which the insurer is responsible. Under this narrow definition of IBNR, claims-made policies would not have IBNR as all claims are known at the end of the policy period (or soon thereafter). However, the term IBNR for claims-made insurance is used in a broad sense and includes changes in incurred amounts (i.e., paid plus case reserves) for known claims.

Claim estimates done by a claim department or TPA must rely on information about the claim at a point in time. The available information may be lacking in important details that will greatly impact the ultimate cost of the claim. Actuaries review the data from the aggregated claims data by year as it changes over time, from the first report of the claim to settlement. From these reviews, the actuary can calculate factors to apply to current case data to estimate the ultimate costs of a body of claims. The difference between estimated ultimate values and current case incurred is IBNR.

Because coverage provided by the PSTIF is claims-made rather than occurrence, all references to IBNR in this report will typically refer exclusively to development on known claims unless otherwise noted.

**LAE**

Loss Adjustment Expense (“LAE”) is the sum of Allocated Loss Adjustment Expense (“ALAE”) and Unallocated Loss Adjustment Expenses (“ULAE”) and represents the total costs of handling and defending claims.

<b>LDF</b>	A Loss Development Factor (“LDF”) is calculated by an actuary from historical claim data and applied to current paid or incurred values to estimate ultimate claim costs for an insurer.
<b>Pure Premium</b>	Pure Premium is the average cost of insurance per insured exposure. For PSTIF, an insured exposure is one tank insured for one year. An example might help clarify the concept. If two tanks are insured and one has a claim for \$100, then the pure premium (average loss per insured exposure) is $\$100 / 2 \text{ insured tanks} = \$50$
<b>Severity</b>	Severity is the average size of claim for a given collection of claims. For instance, if the total cost for three claims is \$45,000, the claim severity (average size of claim) is $\$45,000 / 3 \text{ claims} = \$15,000 \text{ severity}$ .
<b>ULAE</b>	Unallocated Loss Adjustment Expense (“ULAE”) represents the expenses. For the Fund, ULAE represents costs associated with the TPA.

## Conclusions

### Loss and Loss Adjustment Expense Reserve Adequacy

T&M analyzed loss and loss adjustment expense reserves for the six broad categories of claims enumerated above. The following table shows the results of our analysis for these categories:

Missouri Petroleum Storage Tank Insurance Fund Undiscounted Unpaid Loss & ALAE as of June 30, 2016				
Claim Type	Case Outstanding	IBNR	Unpaid ALAE	Unpaid Loss & ALAE
Insurance UST - Release	6,958,219	3,091,216	30,083	10,079,518
Insurance UST - Closure	10,399,403	6,476,174	53,459	16,929,035
Insurance UST - Other	8,722,272	8,640,081	59,527	17,421,880
Remedial UST	21,623,042	3,004,876	63,260	24,691,178
Insurance AST	6,746,648	1,702,667	23,241	8,472,556
Remedial AST	3,810,277	716,949	12,005	4,539,231
<b>Total</b>	<b>58,259,861</b>	<b>23,631,963</b>	<b>241,575</b>	<b>82,133,398</b>

As reserves are held for a number of years, investment income has a measurable impact on needed funding. T&M used the investment yield equal to 0.55%, based on historical investment returns earned by the State. The following table shows the results of our analysis taking into account the effect of investment income:

Missouri Petroleum Storage Tank Insurance Fund Discounted Unpaid Loss & ALAE as of June 30, 2016			
Claim Type	Undiscounted Unpaid Loss & ALAE	Discount	Discounted Unpaid Loss & ALAE
Insurance UST – Release	10,079,518	327,714	9,751,804
Insurance UST – Closure	16,929,035	527,570	16,401,466
Insurance UST – Other	17,421,880	523,671	16,898,209
Remedial UST	24,691,178	500,875	24,190,303
Insurance AST	8,472,556	274,143	8,198,413
Remedial AST	4,539,231	94,434	4,444,797
<b>Total</b>	<b>82,133,398</b>	<b>2,248,407</b>	<b>79,884,992</b>

Although Remedial UST claims made up the majority of the case reserves, IBNR is concentrated in Insurance UST - Other, indicating greater development on known claims in that coverage. In the future, as remedial claims are closed and future remedial claims decrease in number (proportional to the decreasing number of remedial sites), we expect Remedial UST to decrease as a portion of unpaid loss and LAE compared to other claim types.

As of June 30, 2016, the PSTIF held \$83,234,820 in reserves for claims payable. This is \$1,101,422 redundant when compared with the undiscounted unpaid loss & ALAE, and \$3,349,828 redundant when compared with the discounted unpaid loss & ALAE.

If PSTIF were a commercial insurance company, statutory insurance accounting rules would require that all estimated future costs for claims administration for open claims be held as reserves. T&M has estimated those additional costs for Williams & Company, Inc. ("Williams"), the PSTIF third party administrator, to handle all open claims until final settlement at \$14,096,974 on an undiscounted basis and \$13,711,068 on a discounted basis. This amount is not included in the tables above. This amount reflects the extended time horizon over which PSTIF claims are paid.

Because claims are paid incrementally over an extended period, investment income can have a significant impact on the present value of ultimate losses. Projected investment income for this report was 0.55%, based on historical investment yields earned by the State. As a result, as shown in the second chart, above, investment income amounts to approximately 2.7% of undiscounted losses. Improvements in investment yield could increase this amount significantly.

Note that these reserves do not include a provision for claims not yet reported to the PSTIF as of June 30, 2016.

### Reserves Needed at Sunset Date

If the sunset date of the PSTIF is not changed by legislature, the ability for filing new claims will sunset on December 31, 2020. In order to estimate the reserve position of PSTIF as of December 31, 2020, T&M had to make several assumptions. The first assumption was that there would not be any increase in the rate at which releases are reported as the sunset date approaches, see Exhibits E-16 and E-20. (Exhibits E-17 to E-19 and E-21 to E-24 in this report, T&M estimates the impact of various increases in the rate of reporting releases.) T&M also assumed that the releases reported from June 30, 2016 through December 31, 2020 had the same average frequency and severity as the historical data adjusted for trends in the data. The projected estimated ultimate values for these future claims were estimated. Payment patterns by type of release were applied to the data to produce the needed reserves. The following table summarizes the anticipated reserve required to run off all claims reported as of the anticipated fund sunset date:

<b>Missouri Petroleum Storage Tank Insurance Fund</b>		
<b>Unpaid Loss &amp; LAE on December 31, 2020</b>		
<b>Assuming No Increase in the Rate of Reported Releases</b>		
<b>Reserve Study as of June 30, 2016</b>		
	Undiscounted	Discounted
<b>Unpaid Claim Expense</b>	65,983,558	64,177,254
<b>Unpaid Allocated Loss Adjustment Expense</b>	194,647	189,318
<b>Unpaid Unallocated Loss Adjustment Expense</b>	11,358,503	11,047,563
<b>Total</b>	<b>77,536,708</b>	<b>75,414,136</b>

As discussed above, these unpaid claim amounts do not take into account the possibility of increased claim reporting in the period leading up to the fund sunset, nor do the above reserves include amounts required for overhead expenses such as salaries of fund personnel. Discounted losses are calculated using an investment yield of 0.55% which is consistent with current financial documents prepared by PSTIF.

## **Reserving Practices**

Claims handling and underwriting is provided by Williams under a third party administrator (“TPA”) contract with the PSTIF. The Williams claim staff is headed by David Walters, who brings insurance industry experience to the claims handling team. Much of the remaining staff has a technical background in engineering or geology and significant experience in handling claims for the PSTIF.

Williams’ claim philosophy entails providing a swift response to reports of insured leaks and spills in order to minimize further contamination and the associated increased liability. A swift response also enables the claim department to secure pertinent physical evidence (such as damaged piping, valves, etc.) before it is discarded. Discussions during the preparation of this report indicate that the claims philosophy has not changed, although there has been a concerted effort to decrease the time between the receipt of a claim and its closure.

Claims handling is somewhat different than that of an insurance company in that the PSTIF was created to protect the environment and the citizens of Missouri from the impact of petroleum releases. Therefore, the claims handling effort is focused on reasonable and necessary costs for effective response to the leak or spill. The number of PSTIF lawsuits appears relatively modest when compared to commercial general liability insurers. Those claims involving lawsuits have defense counsel assigned as would be expected.

Claims are handled by having the contractor or the consultant assisting the owner/operator submit a proposed work plan and estimated costs to the PSTIF. The planned costs may be challenged by the claims adjuster to craft a more reasonable response if required. Proposed costs must be deemed “reasonable” to be approved. Once the project is started, costs are submitted to the PSTIF for payment or reimbursement.

Remedial claims present a unique situation that would not be encountered in a commercial insurance company. Often the site has been abandoned completely or converted to a different use. Remedial claims generally move forward only when a party is willing to step forward and participate in the remediation process, which usually includes paying the \$10,000 deductible.

During a 2013 claims review, T&M reviewed randomly selected PSTIF claim files. That review revealed that the claim department does “push back” on submitted plans that may be more expensive than needed in a given situation. Notes in various files indicated that Williams’ claims adjusters notified a contractor or consultant that costs exceeded normal levels for the service to be rendered. In some cases reviewed, the claims adjusters have suggested a more cost effective plan for the clean-up and monitoring process than that proposed by the contractor or consultant. There is evidence in the reviewed files that as costs are submitted to the PSTIF items may be denied payment or have reduced payments made if the requested amount is outside the bounds of normal expected payment levels for that item or process.

Adjustors are also charged with establishing appropriate case reserves for the PSTIF. In insurance companies, aggregate incurred values (paid plus case reserves) tend to increase over time as more information regarding claims becomes known. Overall, incurred values produce low loss development factors, which indicates that the case incurred values are a reasonable indicator of the ultimate cost of the claims, particularly for the UST Closure and UST Remedial claims.

When the proposed work plan for the leak or spill site has been completed and all monitoring results are within required limits, the claimant’s environmental consultant informs the Missouri DNR that the impact of the leak or spill meets the current remediation standards. Once notified by the claimant’s environmental consultant, the DNR will then issue a “No Further Action” (“NFA”) letter, meaning the claim is now considered closed. Claims not actively being managed by the owner/operator (i.e.,



cleanup activities have been abandoned or monitoring is not in place) are placed in suspense. Essentially, this means that the claim is not progressing toward the issuance of an NFA letter by the Missouri DNR. These stalled claims are removed from the suspense list and handled in a normal manner if someone again takes an interest in completing the cleanup at a future date.

### **Underwriting**

Williams also provides underwriting services as part of its TPA function. Underwriting guidelines are established by the PSTIF and Williams to determine the insurability of any given tank. An application for insurance with the PSTIF must be filled out by the tank owner/operator along with a method of securing payment of the \$10,000 deductible. In addition, the tank owner/operator must demonstrate that the tanks under their control are not currently leaking.

Policies are written on a claims-made basis which means that claims must be reported during the policy period in order to be covered. Remedial claims are covered as reported without the requirement that coverage was in effect at the time of the release. If the tank system(s) that leaked is/are still in operation, however, coverage must be continuously maintained.

Data required on the application for insurance with PSTIF for UST installations include such items as the installation date, the tank capacity, the type of product contained, estimated monthly throughput, type of tank (e.g., single walled, double walled, fiberglass, etc.), type of piping, and details on overfill and leak protection. The PSTIF application for AST's requires similar documentation requirements along with information on the secondary containment system in place.

Applications for insurance with the PSTIF are reviewed by Williams' personnel and deficiencies are noted. Policies are only issued if the application information is found to be satisfactory.

### **Future Loss and Loss Adjustment Expense, Claim Severity, and Frequency**

T&M was asked to estimate costs for claims to be reported in 2017 and subsequent years, i.e., claims that have not as yet been reported to PSTIF. To perform this projection, T&M applied several methodologies to estimate future loss and loss adjustment expenses based on claim frequency and claim severity for each claim category. As part of the estimation process, T&M assumed that the enabling legislation for PSTIF would be amended to extend the termination date beyond December 31, 2020. This permitted the assumption that claims reporting would proceed as normal. In addition, T&M created scenarios that might represent an expected influx of claims should the program not have its termination date extended.

### ***Projection of Frequency and Severity***

As part of projecting the financial condition of the PSTIF through December 31, 2020, we estimated (1) future claims reporting and (2) future claim severity for each claim category.

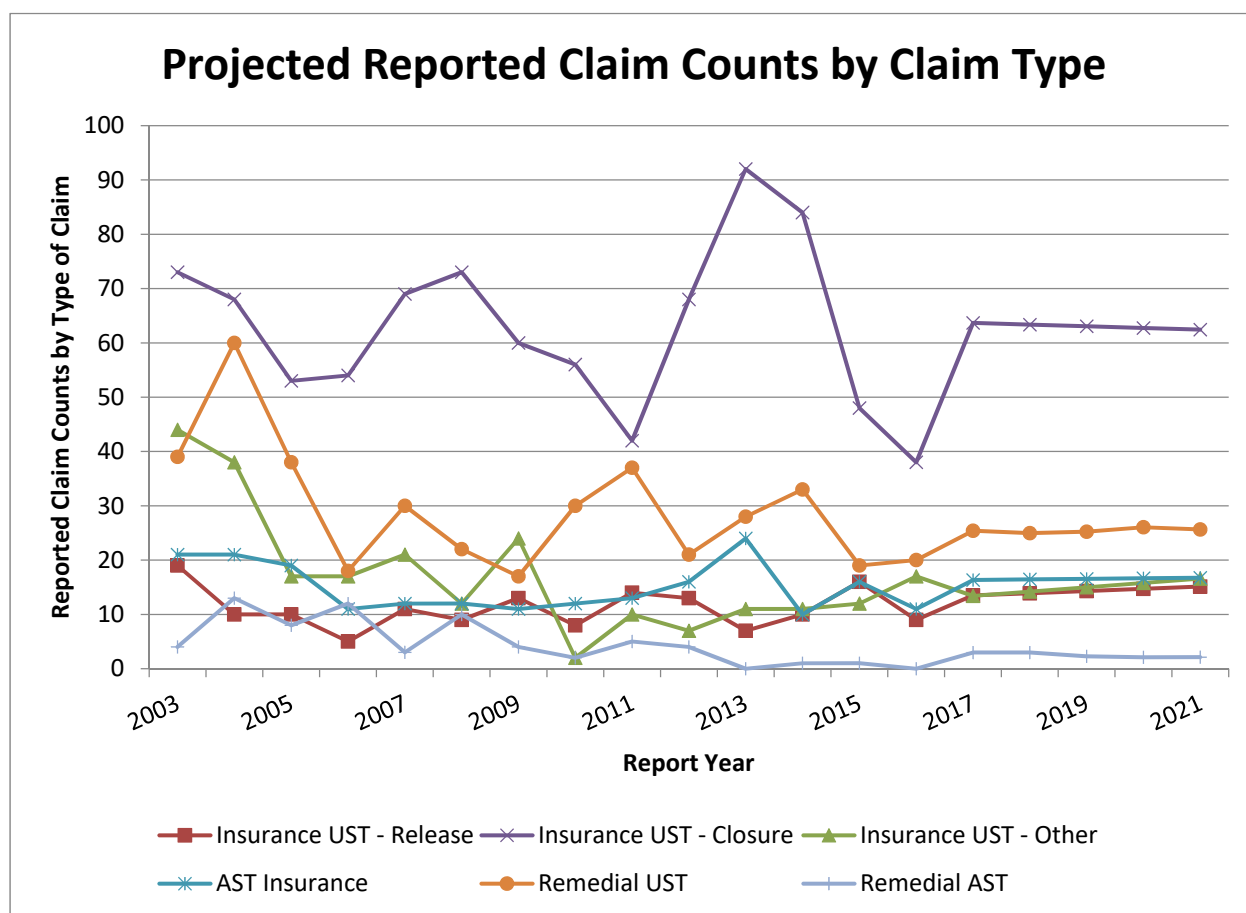
To project future reported claims counts, T&M used a variety of regression techniques. The results from those analyses led us to project a modest positive trend in claim counts for Insurance UST – Release, Insurance AST, and Remedial UST claims. The same regression technique projects a modest negative trend in counts for Insurance UST – Other, Insurance UST – Closure, and for AST remedial claim types.

Although it was anticipated that all remedial claim types would show a modest negative trend, it appears that in recent years there has been an increase in reporting for Remedial UST claims. For this reason, our projections point to a modest increase in Remedial UST claims over the next several years before an eventual decline in Remedial UST reports.

Analysis of policies in-force indicates a modest negative trend in the number of UST policies in-force and a positive trend in AST policies in-force. In the case of in-force AST policies, the PSTIF provided a likely maximum of 1,100 in-force policies at any given time, given a total population of 1,255 sites with ASTs and a likely maximum of 80% to 85% of potential penetration by PSTIF. Our projections suggest that the number of AST policies in-force will approach this number asymptotically over the next several years.

The current analysis of average claim severities this year suggests that Insurance UST – Release and Insurance UST – Other claims will tend to increase in average severity over time. Insurance UST – Closure and Insurance AST claims will tend to decline in average severity over time, and remedial claims of all types will tend to stay at about the same average severity level over time.

The following chart displays historical and projected claim counts by claim type:



### *Projection of Revenues*

The PSTIF has two primary sources of revenue: transport load fees (“TLF”) and participation fees, which is the actual premium charged for the insured risks. Transport load fees are charged to transporters of petroleum on a per load basis. TLF make up the majority of the PSTIF revenues. From 2001 until September 1, 2008, TLF fees were \$40 for 8,000 gallons of petroleum product transported. On September 1, 2008, the TLF fee was reduced to \$20 per 8,000 gallons of petroleum product transported and that charge has remained constant. Enabling legislation grants PSTIF the authority to raise the TLF should the need arise. The overall maximum TLF is set at \$60 per 8,000 gallons of petroleum product by legislation.

Participation fees are charged to tank owners/operators on the basis of the number and categories of tanks insured. For USTs, the participation fee is \$100 per tank for double-walled tanks, and \$125 per tank for single-walled. For ASTs, the fee is \$100 per tank for tanks with a capacity less than 25,000 gallons and \$200 per tank of 25,000 gallons or more. A “new tank” charge of \$100 per tank is a one-time premium payment in addition to the participation fee for both UST and AST tanks payable during the first year of insurance with PSTIF.

T&M has relied on projections of future revenues provided by the PSTIF. We have reviewed these projected revenues for reasonableness and found they are reasonable based on current economic conditions. However, T&M has not attempted to quantify the potential impact on PSTIF revenue of the move to more fuel efficient vehicles and to alternative vehicle fuels. In addition, no attempt has been made to quantify the impact of significant changes in fuel prices on the TLF revenue stream.

### *Projection of Future Cash Flows*

T&M was asked to project cash flows to the PSTIF through the December 31, 2020. To perform this analysis, we combined projections of future claim frequencies and severities, projections of future revenues, and projections of future expenses associated with the PSTIF’s third-party administrator.

Future paid losses were simulated based on assumed probability distributions for frequency, severity, and claim payment speeds. Simulated claim payment speeds also affected the payout speeds of unpaid claims from historical report years.

The following page shows the projected cash flows from July 1, 2016 through December 31, 2020 assuming no influx of claims due to the sunset of the PSTIF program:

**Financial Projections Based on PSTIF 2016 Projections**

	(A) Annual Revenues Fiscal Year:	(B) 2017	(C) 2018	(D) 2019	(E) 2020	(F) 2021 (1/2)	(G) Totals
(1)	Transport load fees	11,250,000	11,200,000	11,150,000	11,100,000	5,525,000	50,225,000
(2)	100 Initial tank fees	18,000	18,000	18,000	18,000	9,000	81,000
(3)	UST participation fees	905,000	901,710	898,420	895,130	445,920	4,046,180
(4)	AST participation fees	355,000	355,000	355,000	355,000	177,500	1,597,500
(5)	Interest income	285,000	278,819	244,478	209,134	90,376	1,107,807
(6)	Total Revenues	12,813,000	12,753,529	12,665,898	12,577,264	6,247,796	57,057,487
	Administrative Expenses Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,300,000	2,254,000	2,208,920	2,164,742	1,060,723	9,988,385
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	45,000	405,000
(9)	Office of Administration	79,248	81,625	84,074	86,596	44,597	376,141
(10)	Section 319.107 Expenses	15,000	15,450	15,914	16,391	8,441	71,196
(11)	Underwriting	365,000	375,950	387,229	398,845	205,405	1,732,429
(12)	Inspections	379,689	391,080	402,812	414,896	213,672	1,802,149
(13)	Training & Loss Prevention Services	25,000	25,750	26,523	27,318	14,069	118,660
(14)	Other Professional Expenses	598,970	616,939	635,447	654,511	337,073	2,842,940
(15)	Legal Expenses	70,000	72,100	74,263	76,491	39,393	332,247
(16)	Department of Revenue	43,090	44,383	45,714	47,086	24,249	204,522
(17)	Attorney General's Office	120,194	123,800	127,514	131,339	67,640	570,487
(18)	PSTIF Board/Staff	200,000	206,000	212,180	218,545	112,551	949,276
(19)	Department of Natural Resources	1,429,131	1,472,005	1,516,165	1,561,650	804,250	6,783,201
(20)	Total Administrative Expenses	5,715,322	5,769,082	5,826,754	5,888,411	2,977,063	26,176,631
	Claim Payments Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(21)	Average / Expected	14,147,469	13,228,354	13,265,267	11,849,172	5,327,908	57,818,170
(22)	Cash balance @ 6/30/16	57,744,191					
	Funds Available at Fiscal Year-End:	2017	2018	2019	2020	2021 (1/2)	
(23)	Average / Expected	50,694,400	44,450,494	38,024,371	32,864,052	30,806,877	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

This chart shows projected revenues, projected expenses, projected claim payments, and projected cash available at year-end. For example, the actuarial central estimate is that \$14.1 million in losses will be paid in fiscal year 2017 in addition to \$5.7 million in administrative expenses. Revenues are expected to total \$12.8 million, leaving a cash balance of \$50.7 million at fiscal year-end 2017. As of December 31, 2020, the actuarial central estimate suggests that there will be a remaining cash balance of approximately \$30.8 million.

Exhibit E-20 expands on this chart by showing claim payments and the resulting cash balances at various confidence levels. For example, there is a 90% probability that the cash balance as of December 31, 2020 will be greater than or equal to \$(6.2) million. There is a 1% (= 100% - 99%) likelihood that the cash balance will be lower than \$(51.7) million.

Exhibits E-21 through E-23 show alternative cash flow scenarios based on the possibility that claim reporting will increase if the fund approaches the sunset date. In these cases, we projected increases in remedial, closure, and “other” claims leading to increased claim costs in 2020 and the first half of the 2021 fiscal year (at which time the fund is projected to be sunset). The financial results of these scenarios are also shown graphically in Exhibits E-17 through E-19.

Exhibit E-24 provides the total projected claim payments for future fiscal years assuming no increase in claim activity. The first section of this exhibit displays future anticipated claim payments arising from currently reported claims (i.e., report years 2016 and prior). The second section displays claim payments arising from claims that will be reported in the future (report years 2017 and after). The third section displays the total of these two amounts.

Claim payments arising from current claims represent the payout of current case reserves and IBNR reserves for report years 2016 and prior. These payments decrease over time as claims are paid out and no additional claims are added, whereas claim payments arising from future report years (report years 2017 and subsequent) will increase over time. The claim payments arising from future report years are not included in the current estimate of unpaid losses as of June 30, 2016, as these claims have not yet been reported. The total claim payments at the bottom of Exhibit E-18 match the total claim payments displayed at the bottom of Exhibit E-17.

### **Large Loss Claims**

Large loss claims are defined as claims that meet or exceed the level of \$250,000. T&M performed several analyses of large loss claims. These analyses included (1) calculation of the amount of time after a claim is reported for it be identified as “large,” (2) consideration of factors that increase the likelihood of a claim being a large claim, (3) consideration of reserving practices for large claims, and (4) consideration of the financial impact of large claims.

Using net incurred losses, T&M examined the current set of claims that have been identified as large. On average, these claims passed the \$250,000 incurred threshold between the 7<sup>th</sup> and 8<sup>th</sup> years after report. Specifically, the claims were identified as large on average at 92 months, which is just before the 8<sup>th</sup> year (96 months). This represents a slight increase from the previous two evaluations in which the average time was 88 months. The following chart shows the number of large claims by the time it took to identify the claims as “large”:



**Missouri Petroleum Storage Tank Insurance Fund**  
**Large Claims by Years Until Discovery**  
**As of June 30, 2016**

<b>Years After Report</b>	<b>Count of Large Claims</b>	<b>Years After Report</b>	<b>Count of Large Claims</b>
1	31	13	9
2	28	14	11
3	23	15	8
4	20	16	8
5	25	17	8
6	15	18	4
7	14	19	6
8	11	20	5
9	19	21	0
10	19	22	0
11	17	23	1
12	6		

This length of time is not unexpected. Development on storage tank claims is slow as compared with many other insured lines of business. There can be a significant period of gathering more information, remediating, of testing and monitoring sites, of further remediation, of possibly re-opening claims, etc., which can lead to a long time period between the initial report of the claim and a determination of the ultimate liability.

Additionally, it is often the case that reserving is performed based on what is the “most likely” outcome (i.e., the mode of the distribution of potential reserves). As a result of this, initial reserves for any line will tend to resemble the most common claims, with large claims identified only as information allows the adjuster to distinguish less common features of claims that might lead to a large claim.

The following chart shows claims currently identified as large as a percent of total reported claims by report year:

**Missouri Petroleum Storage Tank Insurance Fund**  
**Large Claims as a Percent of Total Claims by Report Year**  
**As of June 30, 2016**

<b>Report Year</b>	<b>Total Claims</b>	<b>Large Claims</b>	<b>Percent Large</b>
<b>1994</b>	71	4	5.6%
<b>1995</b>	70	4	5.7%
<b>1996</b>	1,202	77	6.4%
<b>1997</b>	260	19	7.3%
<b>1998</b>	424	27	6.4%
<b>1999</b>	413	26	6.3%
<b>2000</b>	496	33	6.7%
<b>2001</b>	501	18	3.6%
<b>2002</b>	252	12	4.8%
<b>2003</b>	201	8	4.0%
<b>2004</b>	188	15	8.0%
<b>2005</b>	138	6	4.3%
<b>2006</b>	104	5	4.8%
<b>2007</b>	141	10	7.1%
<b>2008</b>	129	8	6.2%
<b>2009</b>	126	1	0.8%
<b>2010</b>	96	1	1.0%
<b>2011</b>	87	4	4.6%
<b>2012</b>	96	3	3.1%
<b>2013</b>	130	1	0.8%
<b>2014</b>	105	4	3.8%
<b>2015</b>	137	2	1.5%
<b>2016</b>	153	0	0.0%
<b>Total</b>	<b>5,520</b>	<b>288</b>	<b>5.2%</b>

This chart shows that the percentage of large loss claims per year seems to have declined somewhat in recent years. This may be a function of older claims having had more time to develop than newer claims.

In addition, the following breakdown shows the anticipated large losses and average lag time to identification of the claims as large by claim type:

Missouri Petroleum Storage Tank Insurance Fund Large Losses by Claim Type as of June 30, 2016				
Claim Type	Total Claims	Large Claims	Percent Large	Average Lag
Insurance UST - Release	263	28	10.6%	72
Insurance UST - Closure	1,476	47	3.2%	81
Insurance UST - Other	559	48	8.6%	106
Remedial UST	2,532	120	4.7%	105
Insurance AST	254	32	12.6%	63
Remedial AST	267	13	4.9%	90
Incident Reports	172	0	0.0%	n/a
<b>Total</b>	<b>5,523</b>	<b>288</b>	<b>5.2%</b>	<b>93</b>

It appears based on this breakdown that tank closures and remedial sites are less likely, on average, to become large loss claims. One possible explanation for this observation is that for old spills to have gone undiscovered for a long time (e.g., in the case of many remedial sites), it is less likely that the petroleum is near a water pathway such as a drinking well where it would be more easily detected. In addition, over a long period of time some of the petroleum products may have had a chance to naturally evaporate or biodegrade.

Similarly, closure claims are not releases discovered as a result of petroleum product vapors in the air, free product, or product in water pathways, but are instead releases that are discovered during tank closure. The way that these releases are discovered therefore implies that closure releases tend to be naturally less severe, because more severe releases are more easily detected before the tank is closed (and therefore coded as “release” or “other” claims).

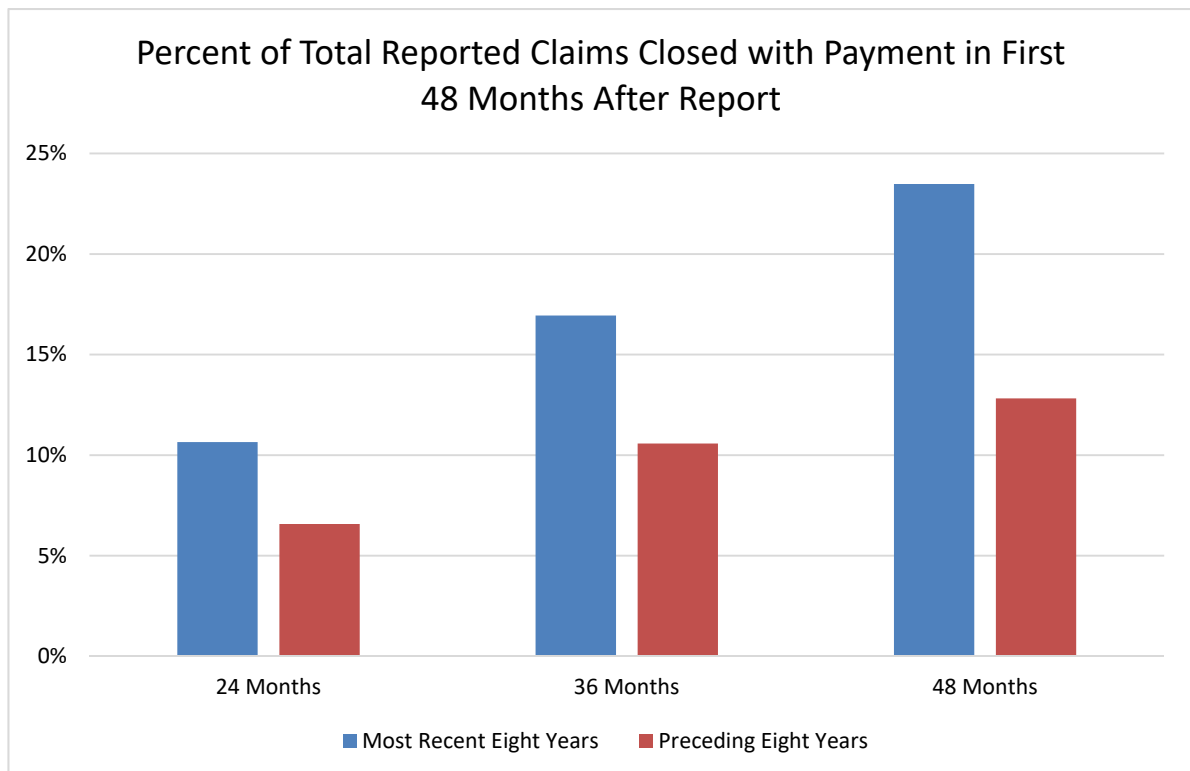
Large losses account for approximately \$139.4 million in incurred losses, or approximately 43.2% of incurred losses, despite accounting for only 5.2% of claims. These values are slightly higher than those determined at the time of the previous analysis, and slightly above average compared to our professional experience.

## Settlement Speed

PSTIF has undertaken significant efforts to improve the speed with which claims come to closure in recent years. However, because such changes are always incremental in nature, it often takes a long time to see them borne out in data.

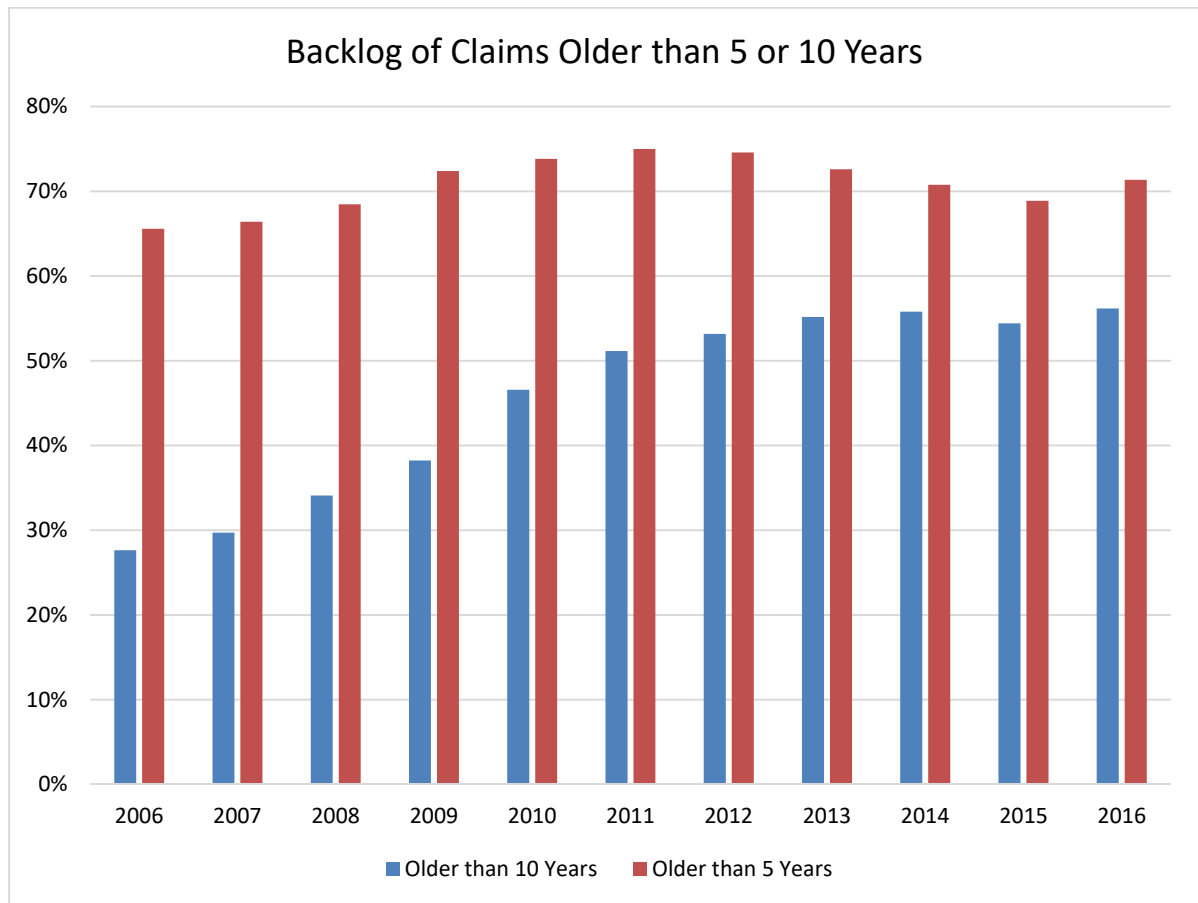
This year, Taylor & Mulder reviewed the rate at which claims are closed. It is our conclusion that although claim closure rates for newly reported claims have generally increased, the number of claims greater than five or ten years old has shown growth or stagnation in recent years.

When excluding claims that have been closed without payment, rates of claim closure have been generally higher in the most recent eight years. The following chart shows the percent of claims closed at 24, 36, and 48 months for the most recent eight calendar years (2009 – 2016) and for the preceding eight years (2001 – 2008):



This pattern is also borne out when looking at all open claims in each fiscal year. In the most recent eight fiscal years, an average 9.8% of open claims have been closed with payment each year. In the preceding eight years, only 6.8% of open claims were closed with payment each year on average. These patterns imply that relatively new claims are being closed more quickly now than in the past.

Despite these apparent increases in claim closure, the backlog of claims older than five years or older than ten years has not declined in recent years. In the case of claims older than ten years, the backlog of claims has increased, pointing to difficulties in closing old claims:



## Recommendations

### 1. Analysis of Outstanding Pollution

The reserves described in this report take into account only the tank releases that are reported to the PSTIF. However, petroleum releases can often go undetected for many years. This accounts for rates of discovery of pollution at tank closures and in remedial sites. Likewise, the reported reserves required to cover unpaid claims as of the fund sunset date reflect only claims reported through the sunset date, not the actual amount of petroleum released into the soil and water as of December 31, 2020. Therefore, pollution that has occurred but that is not yet known has not been taken into account in this report. This amount represents the "remainder" of the petroleum releases after the sunset date. As an example, releases from a 2000 incident might not be discovered until 2040.

In anticipation of the approaching fund sunset date, it may be useful (to the PSTIF board and to the state legislature) to have a better sense of the quantity of pollution that exists but that has not been reported, i.e., the amount of petroleum “in the ground,” whether or not it is known about. This could be accomplished using statistical methods rather than removing and inspecting all tanks for site contamination. For example, one method might investigate the historical rate at which pollution is discovered when closing tanks as a way of estimating the base rate of pollution based on tank age and time since last known release. By comparing that to the current tank population, one could derive an estimate of the amount of pollution that has not yet been discovered.

Another method might look at estimated accident dates on known releases. On an accident year basis, projected IBNR includes anticipated claim payments on claims that have yet to be reported to the PSTIF. This method has the drawback of requiring and relying on estimated dates at which releases actually occurred, however it could serve as a useful check of other estimates.

Such information may assist in determining whether it is in the best interest of human health and the environment to proceed with the fund sunset. If this information is indeed deemed useful, we recommend that the PSTIF carry out a study to determine the likely number of unreported petroleum releases in the state as well as the likely cost to remediate such releases.

## **2. Anticipated Cost of Selling Book**

If it is determined that the PSTIF will sunset on December 31, 2020, the remaining open claims will need to be remediated. This will mean incurring overhead expenses of a shrinking book of liabilities over a long period of time at cost to tax payers.

One option for reducing the burden on tax payers would be to sell the book of liabilities to the private market following fund sunset. This would mean paying a private insurance provider a sum of money in exchange for transferring the responsibility for remediating those claims to the provider. This would effectively extinguish the liabilities for the State of Missouri. Depending on the loss adjustment expenses incurred by the private insurer in handling claims, such an arrangement could lead to remediation of the claims at a decreased cost. It should be noted that there are also potentially significant disadvantages with such a sale that should be weighed heavily before proceeding.

If it is deemed to be potentially in the interest of the State, we would recommend that the PSTIF carry out a study to determine the anticipated costs, advantages, and disadvantages of selling the book of liabilities to the private insurance market following sunset of the fund.

## **Report Distribution and Use**

This report has been prepared for internal use by the management of PSTIF, their accountants, auditors, and attorneys. This report may be reproduced only in its entirety. The Exhibits and Appendices are

integral parts of this report. Other distribution or use of this report by the PSTIF management or related parties described above is not authorized without the prior written permission of Taylor & Mulder, Incorporated. The PSTIF is not authorized to include this report in any marketing or request for proposal solicitations. In addition, it should be understood that T&M consultants are available to respond to any questions by authorized third parties with respect to this report.

## **Conditions and Limitations**

The analyses contained in this report were performed using accepted loss and loss adjustment expense reserving methods adjusted to the special needs of the PSTIF and in conformance with sound actuarial standards and principles. T&M introduced assumptions and judgments that we considered appropriate in the circumstances.

With regard to projections of ultimate values, it should be understood that the emergence and settlement of claims are subject to uncertainty. While we have used our best professional judgment in all instances, projections of future ultimate losses and loss expenses are inherently uncertain because of the random nature of claims occurrences. They are also dependent upon future contingent events and are affected by many additional factors.

PSTIF claim reserving procedures and settlement philosophy, current and perceived social and economic inflation, current and future court and jury attitudes, legislative changes affecting the PSTIF, improvements in technology, and many other economic, legal, political, legislative and social factors all can have significant effects on ultimate claim costs. Therefore, we cannot warrant that actual developments will not differ from current projections. Such differences could be upward or downward and could be significant.



In summary, the ultimate loss and loss adjustment expense levels estimated in this report are subject to potential variations in estimation due to:

- (1) the fact that the ultimate liability of PSTIF is subject to the outcome of events yet to occur;
- (2) the unanticipated changes in the legal, economic, legislative or claims adjudication environments;
- (3) statistical fluctuation in losses around the estimated or expected values when all other factors remain constant; and
- (4) the fact that the actual future loss and loss payment and reporting patterns may differ from those applied in the determination of the expected losses or there may be unanticipated changes in the loss and expense loss and expense payment and reporting patterns;

Accordingly no assurance can be given that future loss emergence will not deviate from the estimated ultimate loss and loss adjustment expenses. However, the ultimate loss and loss adjustment expense estimates were based on a reasonable application of generally accepted actuarial procedures and techniques applied to the information available.

We reviewed the information for overall reasonableness and presented any irregularities to the PSTIF third-party administrator for edification and clarification.

T&M relied without audit or verification on historical loss, loss adjustment expense, exposure data, and other information provided by the PSTIF and its employees and brokers. T&M has relied upon the data provided and on the oral and/or written statements made regarding the quality, accuracy, and completeness of the data and information supplied. Any inaccuracies or inconsistencies in the data could have a significant effect on the conclusions drawn.

Should any inaccuracies be found in the data, T&M should be notified immediately so that the analysis can be adjusted accordingly.

With regard to projections of estimated revenues, it should be understood that the revenue streams are subject to uncertainty. While we have used our best professional judgment in all instances, projections of future revenues are inherently uncertain due to potential changes in technology, the implementation of environmental requirements, the introduction of alternative vehicle fuels, and changes in the economy among others. While T&M has used its best judgment in selecting trend values for each category of revenue, actual revenue collected is dependent upon unknown future events and may be affected by additional factors outside of PSTIF control.

T&M reflected anticipated investment income in the reserves assuming a 0.55% annual rate of return on investments. We did not independently verify the ability of the PSTIF to match this assumed rate.

The analysis in this report was limited to the loss and loss adjustment expense items noted in the scope of this project. This report does not include an examination of the assets of the PSTIF, nor did we form any opinion as to the value or validity of the assets. This report does not include a review or analysis of any income statement or other balance sheet items. This analysis with respect to loss and loss adjustment expense reserves is based upon the assumption that all reserves are backed by valid assets and that these assets reflect suitably scheduled maturities and/or sufficient liquidity to meet cash flow requirements.

This report is limited in scope to the estimate of the level of reserve adequacy at the evaluation date of the report. It also includes projections regarding cash flow of the operations of the PSTIF under certain narrow assumptions and conditions.

This report was prepared for use by persons technically competent in insurance financial matters. Persons receiving this report should be made aware of the availability of T&M, Inc. personnel to answer questions and/or amplify on any matter addressed therein.



## **Actuarial Analysis**

### **Sources of Data**

Data was provided by Ms. Carol Eighmey with the PSTIF and Ms. Dorcee Lauen with Williams & Company Consulting, Inc., PSTIF's third-party administrator, in the form of several files. A full description of the names and contents of these files may be found as an appendix at the end of this report. In addition, we received additional information from interviews with PSTIF management and Williams' personnel, as well as from the PSTIF website, [www.pstif.org](http://www.pstif.org).

### **Overall Methodology**

#### **Selection of Factors**

In each of the methods described below, our selections of development factors were based on the evaluation of the predictive value of the various historical averages and the perceived presence or absence of trends and singularities. Apparent statistical aberrations were eliminated either judgmentally or by selecting a longer experience period to increase the credibility of the experience, whichever we believed more appropriate in the particular circumstances.

#### **Paid Development Method**

The paid development method uses historical loss payment patterns to project actual payments as of a given valuation date to ultimate. The PSTIF's historical payment patterns or the fitted loss development factors were relied upon in selecting the expected payment patterns at each evaluation. The difference between the projected ultimate losses and the losses and allocated loss adjustment expenses paid through the evaluation date is the estimated reserve as of the evaluation date.

Estimates produced using the paid development method are not affected by changes in the case reserve position of the PSTIF which might have occurred during the review period, but may be understated since they ignore large unpaid claims. Also, this method may be susceptible to any changes in case settlement philosophy and/or speed of payment.

### **Incurred Development Method**

The incurred, or reported, development method is similar to the paid development method and uses historical reporting patterns to project actual reported amounts (excluding IBNR) as of a given evaluation date to ultimate. The difference between the projected ultimate losses and the losses paid through the evaluation date is the estimated reserve as of the evaluation date.

In many situations, the incurred development method is preferred over the paid method since large open but unpaid claims are considered. This method is more responsive to changes in the external business environment, since changes in liability laws, legislative changes affecting the PSTIF, court decisions and other external factors are generally reflected in the case reserves as soon as claims management becomes aware of them. As a result, the incurred loss development factors at each stage of development tend to be lower, and more stable, than those of the corresponding paid development method. However, the incurred development method may be affected by changes in case reserving practices over time and, to a lesser extent, also may be affected by changes in claims settlement rates.

### **Bornhuetter-Ferguson Methods**

Loss development methods may be affected by changes in the reporting and payment of claims. Random fluctuations in the reporting and payment of claims (such as may result from a single unusually large claim) are magnified by the development factors, potentially resulting in biased estimates and wide changes in the estimates from one evaluation to the next. To minimize such

fluctuations, we applied the Bornhuetter-Ferguson method to incurred losses and to paid losses. The Bornhuetter-Ferguson method is particularly suited for projecting loss reserves for longer-tailed business with volatile or limited development patterns. The Bornhuetter-Ferguson method represents a compromise between traditional loss development methods such as the incurred and paid loss development methods and an expected loss ratio method.

For the incurred Bornhuetter-Ferguson method, initial expected losses are established for each accident year to be consistent with projected pure premium amounts, i.e. projected losses divided by an exposure base (in this case, insured tanks in-force for insurance claims or remaining potential remediation sites for remedial claims). These initial expected losses are then split into two components: expected reported losses and expected unreported losses. The expected unreported losses, which comprise the IBNR and bulk reserves for each accident year, are calculated as a function of the earned premium, the initial expected loss ratio, and the expected portion of ultimate losses that remains unreported or unreserved as of the evaluation date.

For the paid Bornhuetter-Ferguson method, initial expected losses are also derived from projected pure premium amounts. These initial expected losses are then split into two components: expected paid losses and expected unpaid losses. The expected unpaid losses, which comprise the IBNR and case reserves for each accident year, are calculated as a function of the initial expected loss ratio, the initial expected ultimate losses, and the expected portion of ultimate losses that remains unpaid as of the evaluation date.

### **Projection Methodologies for Cash Flow Analysis**

Several overlapping projection methodologies were used to perform the cash flow analysis. First, regression techniques were used to project claim frequency and severity into future periods. These projections were then converted into parameters for a simulation model.

The simulation model used a Poisson distribution to predict the number of claims of each category for each report year. For each predicted claim, a lognormal distribution was then generated as the prediction of the ultimate size of that claim. For example, one trial of the simulation might predict that there would be 10 UST Insurance (Release) claims in a given report year. Each of those 10 claims would have a simulated claim size drawn from the lognormal distribution.

Repeating this process 10,000 times for each claim type and for each report year from 2016 to 2020, we obtained a set of potential ultimate losses that represent a probability distribution of outcomes, where more common answers represent more likely outcomes.

Historical losses were simulated using incurred loss development triangles. For each triangle, the loss development factors were simulated using normal distributions for each development period. The mean for each development period was selected to be the actuarial central estimate, while the standard deviation was selected to be the standard deviation of the historical LDFs.

For both historical and future claims, anticipated future payments by fiscal year were determined by applying fixed projected payment patterns to unpaid losses to determine the anticipated timing of future payments.

Combining these projections, we obtained an estimate of the range of possibilities for loss payments over time. We compared these loss payment projections to revenue projections to obtain an estimate of the range of possible outcomes for cash flows over time.

## **Methodology by Claim Type**

Long-tailed lines of business have some important properties. These are lines of business for which claim payments can extend over a very long period (10 years or more) before closure. As claim payments are made over a long time horizon, the first few years after a claim is reported may have little or no actual claim payments. This produces relatively low paid losses at early maturities, and as a result, payment patterns can be strongly affected by small random fluctuations in payments from year to year.

The long payment pattern has a substantial effect on most categories of PSTIF claims. Paid losses at early maturities have shown extreme volatility, and as a result, paid losses have very low credibility (i.e., statistical stability) for some categories of claims.

By contrast, incurred losses have shown greater stability. When a claim is reported to the PSTIF, a reserve is established based on the expected ultimate loss for the claim. As the claim matures and losses are paid out, the incurred loss may be increased or decreased commensurate with the adjuster's interpretation of the ultimate value of the claim. In this case, the first estimate by the adjusters is close enough to the ultimate loss that development is low when compared to paid losses. Because development patterns for incurred losses were more stable over time, incurred loss development methods received greater relative weight in our analysis.

Incurred loss development, by contrast, is stable. Incurred losses do not undergo the same extreme changes as paid losses, making estimates from incurred losses more credible. In some cases, incurred loss



development is modestly negative, implying that early reserve estimates are slightly over-stated. However, these trends seem to reverse at later maturities, returning incurred losses on average to slightly higher than the initial reserves as of 12 months.

When relatively little credibility could be placed in the loss development patterns observed in paid or incurred losses, higher reliance was placed on the Bornhuetter-Ferguson methods. These methods produce estimates that are not as significantly influenced by random variations in claim payout or reporting speeds, but are highly stable from year to year and are a reflection of the overall level of exposure.

### **Selections of Ultimate Losses**

Generally, the selection of ultimate losses was based on selecting incurred loss development method for older years, as this method seemed to give the best result. In years where there was great variability, particularly more recent report years, we selected a combination of methods (including the Bornhuetter-Ferguson method) to provide greater stability in results.

Any exceptions to the above description were based on our review of the methods combined with our knowledge of specific accident years and other considerations as described in the background section of our report.

### **Loss Reserve Discounting**

T&M reflected anticipated investment income on reserves using an assumed discount rate of 0.55%. This rate was based on historical yields by the State as of June 30, 2016. We did not independently verify the ability of the PSTIF to match these rates at June 30, 2016.

The undiscounted reserves and the discounted reserves are shown in the summary section of our report. The future payout of the undiscounted recommended reserve from 2017 to 2025 separately and for years subsequent to fiscal year 2025 on a combined basis is also provided in this section.

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
Executive Summary - Unpaid Losses & ALAE

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Case		Unpaid	Undiscounted		Discounted
<u>Claim Type</u>	<u>Reserve</u>	<u>IBNR</u>	<u>ALAE</u>	<u>Unpaid</u> <u>Loss &amp; ALAE</u>	<u>Discount</u>	<u>Unpaid</u> <u>Loss &amp; ALAE</u>
Insurance UST - Release	6,958,219	3,091,216	30,083	10,079,518	327,714	9,751,804
Insurance UST - Closure	10,399,403	6,476,174	53,459	16,929,035	527,570	16,401,466
Insurance UST - Other	8,722,272	8,640,081	59,527	17,421,880	523,671	16,898,209
Remedial UST	21,623,042	3,004,876	63,260	24,691,178	500,875	24,190,303
Insurance AST	6,746,648	1,702,667	23,241	8,472,556	274,143	8,198,413
Remedial AST	3,810,277	716,949	12,005	4,539,231	94,434	4,444,797
<b>Total</b>	<b>58,259,861</b>	<b>23,631,963</b>	<b>241,575</b>	<b>82,133,398</b>	<b>2,248,407</b>	<b>79,884,992</b>

Notes: Col (5) = (2) + (3) + (4)  
Col (7) = (5) - (6)

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	4,272,646	4,268,960	-	-	4,268,960
1995	4,378,223	4,197,365	-	-	4,197,365
1996	76,287,583	73,905,345	-	-	73,905,345
1997	20,400,630	19,268,519	-	-	19,268,519
1998	31,045,129	29,696,073	-	-	29,696,073
1999	26,540,856	25,506,160	-	-	25,506,160
2000	34,085,525	33,716,434	-	-	33,716,434
2001	15,261,358	15,343,285	-	-	15,343,285
2002	16,127,057	16,143,519	-	-	16,143,519
2003	12,233,287	12,255,479	-	-	12,255,479
2004	16,325,724	15,288,426	-	-	15,288,426
2005	10,883,911	10,407,439	-	-	10,395,205
2006	7,297,502	7,533,173	-	-	7,533,173
2007	12,570,911	10,324,378	-	-	10,314,853
2008	10,654,523	9,092,592	9,582,075	8,867,665	9,047,817
2009	8,200,451	6,889,293	8,263,448	7,069,458	7,116,355
2010	4,334,246	4,489,042	6,191,876	5,205,918	4,360,262
2011	10,125,364	9,227,576	9,001,924	9,064,432	8,857,227
2012	9,203,468	8,746,370	8,910,187	8,827,622	8,461,959
2013	8,233,303	7,620,533	8,460,817	8,045,369	7,287,666
2014	9,439,085	7,932,568	8,365,413	8,336,587	7,600,405
2015	11,675,704	10,136,390	8,323,021	8,604,281	8,642,538
2016	6,856,766	6,640,545	7,382,515	6,286,662	6,834,588
TOTAL	366,433,249	348,629,464	74,481,277	70,307,993	346,041,612

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>	<u>PAID</u> <u>ALAE</u>	<u>UNPAID</u> <u>ALAE</u>	<u>ULTIMATE</u> <u>ALAE</u>	<u>ULTIMATE</u> <u>LOSS &amp; ALAE</u>	<u>UNPAID</u> <u>LOSS &amp; ALAE</u>
1994	4,268,960	3,702,345	4,268,960	566,615	-	566,615	6,347	1,297	7,644	4,276,604	567,912
1995	4,197,365	4,105,319	4,177,131	71,812	20,234	92,046	9,365	257	9,622	4,206,987	92,304
1996	73,905,345	65,236,141	73,868,188	8,632,047	37,158	8,669,204	124,218	19,931	144,150	74,049,495	8,689,136
1997	19,268,519	17,613,238	19,145,997	1,532,759	122,522	1,655,281	41,416	4,070	45,486	19,314,005	1,659,351
1998	29,696,073	25,861,796	29,272,099	3,410,303	423,973	3,834,276	79,968	9,748	89,716	29,785,789	3,844,025
1999	25,506,160	22,626,735	25,004,934	2,378,199	501,226	2,879,425	73,971	7,739	81,710	25,587,870	2,887,164
2000	33,716,434	26,405,253	32,557,772	6,152,519	1,158,662	7,311,181	76,936	19,390	96,326	33,812,760	7,330,571
2001	15,343,285	12,139,436	15,001,325	2,861,890	341,960	3,203,850	49,896	8,117	58,013	15,401,298	3,211,967
2002	16,143,519	12,406,480	15,304,910	2,898,430	838,609	3,737,039	43,453	10,475	53,928	16,197,447	3,747,514
2003	12,255,479	9,401,284	11,464,882	2,063,599	790,596	2,854,195	51,805	8,344	60,149	12,315,628	2,862,539
2004	15,288,426	12,237,842	14,154,561	1,916,719	1,133,865	3,050,584	132,740	9,579	142,319	15,430,746	3,060,163
2005	10,395,205	7,872,390	9,683,017	1,810,627	712,188	2,522,815	105,340	7,406	112,746	10,507,951	2,530,221
2006	7,533,173	5,030,814	6,842,669	1,811,855	690,505	2,502,359	61,548	7,309	68,858	7,602,031	2,509,669
2007	10,314,853	8,292,318	9,483,771	1,191,453	831,082	2,022,535	96,648	6,533	103,180	10,418,033	2,029,068
2008	9,047,817	6,346,011	7,937,510	1,591,498	1,110,307	2,701,805	36,610	8,727	45,337	9,093,154	2,710,532
2009	7,116,355	4,636,640	5,884,116	1,247,476	1,232,239	2,479,715	28,240	8,498	36,738	7,153,093	2,488,213
2010	4,360,262	2,395,420	3,866,746	1,471,326	493,515	1,964,842	25,591	5,628	31,219	4,391,481	1,970,470
2011	8,857,227	4,813,019	7,426,651	2,613,632	1,430,576	4,044,208	27,559	12,533	40,093	8,897,320	4,056,742
2012	8,461,959	4,319,870	6,889,250	2,569,379	1,572,709	4,142,088	28,216	13,083	41,299	8,503,258	4,155,171
2013	7,287,666	3,386,614	5,818,112	2,431,498	1,469,554	3,901,052	23,765	12,295	36,060	7,323,726	3,913,347
2014	7,600,405	2,809,553	5,674,627	2,865,074	1,925,778	4,790,852	21,978	15,376	37,354	7,637,759	4,806,229
2015	8,642,538	2,167,494	5,721,288	3,553,794	2,921,250	6,475,044	33,390	21,511	54,901	8,697,439	6,496,555
2016	6,834,588	343,777	2,961,132	2,617,355	3,873,456	6,490,811	9,599	23,727	33,326	6,867,914	6,514,538
TOTAL	346,041,612	264,149,789	322,409,649	58,259,861	23,631,963	81,891,823	1,188,599	241,575	1,430,174	347,471,786	82,133,398

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	253,899	250,213	-	-	250,213
1995	241,953	241,953	-	-	241,953
1996	1,366,007	1,366,007	-	-	1,366,007
1997	2,343,567	2,135,701	-	-	2,135,701
1998	1,540,571	1,341,060	-	-	1,341,060
1999	142,573	142,573	-	-	142,573
2000	2,199,740	2,199,740	-	-	2,199,740
2001	1,224,258	1,095,194	-	-	1,095,194
2002	801,183	707,027	-	-	707,027
2003	2,077,214	2,099,512	-	-	2,099,512
2004	1,199,204	1,216,688	-	-	1,216,688
2005	940,095	959,613	-	-	959,613
2006	213,084	218,704	-	-	218,704
2007	3,608,085	2,514,222	-	-	2,514,222
2008	3,215,928	2,051,974	2,447,327	2,051,361	2,051,974
2009	1,469,362	1,363,973	1,668,676	1,417,827	1,363,973
2010	443,585	357,430	1,216,916	536,859	357,430
2011	3,773,955	2,402,231	2,627,226	2,311,628	2,356,929
2012	1,153,378	1,253,878	1,513,339	1,387,376	1,326,993
2013	294,155	199,631	1,206,865	637,002	294,155
2014	3,218,876	2,101,603	2,019,117	1,972,864	1,995,990
2015	3,100,440	2,957,580	1,826,634	2,457,051	2,141,843
2016	715,694	688,270	1,301,784	1,097,295	1,199,540
TOTAL	35,536,804	29,864,776	15,827,885	13,869,263	29,577,033

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	SELECTED ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	250,213	220,213	250,213	30,000	-	30,000
1995	241,953	241,953	241,953	-	-	-
1996	1,366,007	1,082,062	1,366,007	283,944	-	283,944
1997	2,135,701	1,976,544	2,135,701	159,157	-	159,157
1998	1,341,060	1,280,060	1,341,060	61,000	-	61,000
1999	142,573	142,573	142,573	-	-	-
2000	2,199,740	1,715,267	2,199,740	484,473	-	484,473
2001	1,095,194	948,559	1,092,066	143,507	3,127	146,634
2002	707,027	607,282	700,590	93,307	6,437	99,745
2003	2,099,512	1,497,429	2,077,214	579,785	22,298	602,083
2004	1,216,688	811,449	1,199,204	387,756	17,484	405,240
2005	959,613	584,630	940,095	355,465	19,519	374,983
2006	218,704	103,765	213,084	109,319	5,621	114,939
2007	2,514,222	2,174,856	2,424,277	249,422	89,945	339,366
2008	2,051,974	1,636,341	1,930,604	294,262	121,370	415,632
2009	1,363,973	688,297	1,247,747	559,450	116,226	675,676
2010	357,430	194,452	316,478	122,026	40,952	162,978
2011	2,356,929	1,569,874	1,983,357	413,483	373,573	787,055
2012	1,326,993	440,068	967,172	527,104	359,820	886,925
2013	294,155	100,842	144,674	43,832	149,481	193,314
2014	1,995,990	882,491	1,374,411	491,920	621,580	1,113,500
2015	2,141,843	618,928	1,813,304	1,194,377	328,538	1,522,915
2016	1,199,540	9,664	384,295	374,631	815,245	1,189,876
TOTAL	29,577,033	19,527,598	26,485,817	6,958,219	3,091,216	10,049,435

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	875,960	875,960	-	-	875,960
1995	830,629	830,629	-	-	830,629
1996	4,082,382	3,887,596	-	-	3,887,596
1997	4,699,432	4,693,260	-	-	4,693,260
1998	5,277,926	5,297,002	-	-	5,297,002
1999	10,180,460	10,053,616	-	-	10,053,616
2000	5,888,205	5,728,207	-	-	5,728,207
2001	2,359,733	2,302,577	-	-	2,302,577
2002	4,854,884	4,577,689	-	-	4,577,689
2003	3,503,268	3,245,820	-	-	3,245,820
2004	2,524,911	2,454,184	-	-	2,454,184
2005	2,532,523	2,594,441	-	-	2,594,441
2006	1,606,518	1,548,385	-	-	1,548,385
2007	4,290,568	4,094,514	-	-	4,094,514
2008	3,088,004	3,144,369	3,079,617	3,134,561	3,116,186
2009	2,603,096	2,148,971	2,728,453	2,259,036	2,376,033
2010	1,965,019	2,128,814	2,281,390	2,230,847	2,046,917
2011	1,934,360	1,841,702	2,272,245	1,989,584	2,130,914
2012	2,869,239	3,346,794	2,828,483	3,254,753	3,041,618
2013	3,436,757	3,592,302	3,067,749	3,432,001	3,249,875
2014	3,211,455	3,237,025	2,867,661	3,095,550	2,981,606
2015	1,933,120	1,494,011	2,341,708	1,766,951	2,054,330
2016	1,544,012	650,542	2,363,408	1,082,591	1,722,999
TOTAL	76,092,462	73,768,410	23,830,714	22,245,873	74,904,358



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	SELECTED ULTIMATE	PAID LOSS	INCURRED LOSS	CASE RESERVE	IBNR RESERVE	UNPAID LOSS
1994	875,960	724,556	875,960	151,404	-	151,404
1995	830,629	830,629	830,629	-	-	-
1996	3,887,596	3,785,792	3,887,596	101,804	-	101,804
1997	4,693,260	4,309,814	4,693,260	383,446	-	383,446
1998	5,297,002	4,773,615	5,265,050	491,435	31,952	523,387
1999	10,053,616	9,049,576	9,873,136	823,560	180,480	1,004,040
2000	5,728,207	5,122,239	5,574,262	452,023	153,945	605,967
2001	2,302,577	2,018,978	2,231,893	212,915	70,684	283,599
2002	4,577,689	4,079,843	4,369,340	289,497	208,350	497,847
2003	3,245,820	2,887,346	3,081,544	194,198	164,276	358,474
2004	2,454,184	2,050,897	2,310,706	259,809	143,478	403,287
2005	2,594,441	2,004,142	2,411,172	407,030	183,269	590,299
2006	1,548,385	1,239,850	1,418,755	178,905	129,630	308,535
2007	4,094,514	3,195,238	3,692,463	497,225	402,051	899,276
2008	3,116,186	2,203,792	2,784,301	580,509	331,886	912,395
2009	2,376,033	1,771,068	1,869,496	98,428	506,538	604,966
2010	2,046,917	1,293,850	1,843,937	550,087	202,980	753,066
2011	2,130,914	1,208,286	1,567,380	359,094	563,534	922,628
2012	3,041,618	1,672,985	2,811,353	1,138,368	230,265	1,368,633
2013	3,249,875	1,711,865	2,945,843	1,233,978	304,032	1,538,010
2014	2,981,606	1,354,211	2,498,436	1,144,226	483,170	1,627,395
2015	2,054,330	591,352	1,097,254	505,901	957,076	1,462,977
2016	1,722,999	148,859	494,420	345,561	1,228,579	1,574,141
TOTAL	74,904,358	58,028,782	68,428,185	10,399,403	6,476,174	16,875,576

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	3,142,787	3,142,787	-	-	3,142,787
1995	3,084,788	2,903,930	-	-	2,903,930
1996	2,381,278	2,381,593	-	-	2,381,593
1997	4,033,353	3,808,289	-	-	3,808,289
1998	2,905,273	3,024,567	-	-	3,024,567
1999	3,112,983	2,912,071	-	-	2,912,071
2000	4,155,834	4,126,171	-	-	4,126,171
2001	1,069,609	1,157,042	-	-	1,157,042
2002	4,454,936	4,605,811	-	-	4,605,811
2003	3,364,032	3,573,153	-	-	3,573,153
2004	5,266,042	4,897,180	-	-	4,897,180
2005	2,211,693	2,096,300	-	-	2,096,300
2006	2,775,174	3,265,175	-	-	3,265,175
2007	1,248,574	1,073,261	-	-	1,073,261
2008	2,395,530	2,492,079	1,984,957	2,243,100	2,492,079
2009	1,721,767	1,310,658	1,619,531	1,366,972	1,310,658
2010	431,284	342,944	1,028,606	743,656	342,944
2011	1,261,386	1,963,501	1,469,486	1,831,874	1,612,443
2012	1,295,455	1,053,169	1,544,149	1,314,508	1,174,312
2013	1,238,993	1,222,391	1,606,051	1,465,239	1,230,692
2014	836,395	713,917	1,627,338	1,352,078	775,156
2015	5,203,010	3,884,810	2,375,178	2,633,028	2,504,103
2016	2,570,305	3,421,162	1,885,296	2,270,351	2,077,823
TOTAL	60,160,482	59,371,962	15,140,591	15,220,807	56,487,543

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	3,142,787	2,757,576	3,142,787	385,211	-	385,211
1995	2,903,930	2,811,884	2,883,696	71,812	20,234	92,046
1996	2,381,593	2,139,915	2,344,436	204,521	37,158	241,678
1997	3,808,289	3,559,664	3,708,217	148,553	100,073	248,625
1998	3,024,567	2,382,158	2,905,273	523,116	119,294	642,409
1999	2,912,071	2,627,746	2,750,103	122,357	161,968	284,325
2000	4,126,171	3,426,721	3,878,829	452,109	247,342	699,451
2001	1,157,042	805,227	1,069,609	264,382	87,432	351,814
2002	4,605,811	3,483,473	4,218,927	735,454	386,884	1,122,338
2003	3,573,153	2,565,592	3,111,514	545,922	461,639	1,007,561
2004	4,897,180	3,851,449	4,188,550	337,101	708,630	1,045,731
2005	2,096,300	1,535,671	1,801,967	266,296	294,333	560,629
2006	3,265,175	1,851,282	2,741,604	890,322	523,571	1,413,893
2007	1,073,261	765,632	867,453	101,821	205,809	307,629
2008	2,492,079	1,350,478	1,894,140	543,662	597,939	1,141,601
2009	1,310,658	884,880	943,038	58,159	367,620	425,779
2010	342,944	200,650	228,932	28,283	114,012	142,295
2011	1,612,443	510,173	1,230,702	720,529	381,742	1,102,270
2012	1,174,312	438,523	607,983	169,460	566,329	735,790
2013	1,230,692	310,824	636,393	325,569	594,299	919,868
2014	775,156	133,385	285,522	152,136	489,635	641,771
2015	2,504,103	692,863	1,532,384	839,521	971,719	1,811,240
2016	2,077,823	39,426	875,404	835,978	1,202,419	2,038,398
TOTAL	56,487,543	39,125,189	47,847,461	8,722,272	8,640,081	17,362,353

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	-	-	-	-	-
1995	114,027	114,027	-	-	114,027
1996	68,337,579	66,150,233	-	-	66,150,233
1997	9,324,278	8,631,269	-	-	8,631,269
1998	20,208,225	18,920,310	-	-	18,920,310
1999	8,802,904	8,283,616	-	-	8,283,616
2000	15,398,782	15,072,191	-	-	15,072,191
2001	2,629,369	2,756,881	-	-	2,756,881
2002	3,344,801	3,538,667	-	-	3,538,667
2003	1,158,699	1,227,240	-	-	1,227,240
2004	2,007,262	1,889,495	-	-	1,889,495
2005	3,302,119	2,992,338	-	-	2,992,338
2006	489,404	486,679	-	-	486,679
2007	1,691,149	1,374,928	-	-	1,374,928
2008	1,061,649	714,124	1,167,370	758,209	714,124
2009	1,168,376	864,870	1,186,140	892,752	864,870
2010	889,689	983,456	938,256	996,333	936,573
2011	1,763,581	1,966,308	1,367,378	1,870,497	1,618,938
2012	569,083	398,451	800,104	467,618	633,861
2013	1,414,558	1,117,125	1,081,207	1,082,035	1,081,621
2014	1,388,952	876,113	998,050	868,310	933,180
2015	379,643	467,090	668,729	523,645	596,187
2016	505,008	690,356	688,943	696,736	692,839
TOTAL	145,949,138	139,515,766	8,896,177	8,156,135	139,510,066

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Summary of Case & IBNR Reserves

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	-	-	-	-	-	-
1995	114,027	114,027	114,027	-	-	-
1996	66,150,233	58,124,590	66,150,233	8,025,643	-	8,025,643
1997	8,631,269	7,767,216	8,608,820	841,604	22,449	864,053
1998	18,920,310	16,312,830	18,647,583	2,334,753	272,727	2,607,480
1999	8,283,616	6,982,923	8,144,203	1,161,279	139,414	1,300,693
2000	15,072,191	11,922,692	14,461,977	2,539,286	610,213	3,149,499
2001	2,756,881	1,922,955	2,629,369	706,414	127,513	833,927
2002	3,538,667	2,358,085	3,344,801	986,716	193,866	1,180,582
2003	1,227,240	833,873	1,141,225	307,352	86,015	393,367
2004	1,889,495	1,404,444	1,752,808	348,364	136,687	485,051
2005	2,992,338	2,236,223	2,777,459	541,236	214,879	756,115
2006	486,679	300,938	450,938	150,000	35,741	185,741
2007	1,374,928	1,006,421	1,264,959	258,538	109,969	368,507
2008	714,124	587,385	660,233	72,848	53,891	126,739
2009	864,870	612,576	794,122	181,546	70,748	252,294
2010	936,573	378,531	889,689	511,159	46,883	558,042
2011	1,618,938	813,135	1,763,581	950,446	(144,644)	805,802
2012	633,861	235,093	349,610	114,517	284,251	398,768
2013	1,081,621	510,062	942,049	431,987	139,572	571,559
2014	933,180	420,375	732,853	312,478	200,327	512,805
2015	596,187	37,773	379,643	341,871	216,544	558,414
2016	692,839	-	505,008	505,008	187,831	692,839
TOTAL	139,510,066	114,882,147	136,505,189	21,623,042	3,004,876	24,627,918

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Summary of Ultimate Losses

(1)	(2)	(3)	(4)	(5)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID BF</u> <u>ULTIMATE</u>	<u>INC BF</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>
1994	-	-	-	-	-
1995	-	-	-	-	-
1996	-	-	-	-	-
1997	-	-	-	-	-
1998	478,042	478,042	-	-	478,042
1999	2,767,896	2,689,230	-	-	2,689,230
2000	1,195,793	1,195,793	-	-	1,195,793
2001	6,318,643	6,318,643	-	-	6,318,643
2002	2,234,838	2,234,838	-	-	2,234,838
2003	1,501,010	1,513,116	-	-	1,513,116
2004	3,166,613	2,861,780	-	-	2,861,780
2005	1,817,644	1,672,674	-	-	1,672,674
2006	2,213,322	2,014,231	-	-	2,014,231
2007	1,690,784	1,216,178	-	-	1,216,178
2008	841,626	621,668	817,539	622,992	621,668
2009	993,889	966,086	913,695	946,870	966,086
2010	604,667	676,398	687,805	690,812	676,398
2011	1,392,082	1,053,835	1,223,312	1,052,693	1,138,003
2012	3,316,313	2,694,077	2,176,853	2,393,497	2,285,175
2013	1,848,839	1,489,084	1,446,426	1,416,219	1,431,323
2014	783,406	1,003,910	794,854	1,034,091	914,473
2015	712,583	986,443	986,953	1,011,833	999,393
2016	1,521,747	1,190,215	1,059,077	1,116,310	1,087,694
TOTAL	35,399,737	32,876,241	10,106,514	10,285,317	32,314,736

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Summary of Case & IBNR Reserves

(1) RY	(2) SELECTED <u>ULTIMATE</u>	(3) PAID <u>LOSS</u>	(4) INCURRED <u>LOSS</u>	(5) CASE <u>RESERVE</u>	(6) IBNR <u>RESERVE</u>	(7) UNPAID <u>LOSS</u>
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	478,042	478,042	478,042	-	-	-
1999	2,689,230	2,529,597	2,689,230	159,632	-	159,632
2000	1,195,793	1,195,793	1,195,793	-	-	-
2001	6,318,643	5,488,608	6,318,643	830,035	-	830,035
2002	2,234,838	1,638,304	2,234,838	596,534	-	596,534
2003	1,513,116	1,145,541	1,501,010	355,469	12,106	367,575
2004	2,861,780	2,565,442	2,884,520	319,078	(22,739)	296,339
2005	1,672,674	1,431,885	1,672,486	240,601	188	240,789
2006	2,014,231	1,534,980	2,018,289	483,309	(4,057)	479,252
2007	1,216,178	1,108,422	1,192,870	84,448	23,308	107,756
2008	621,668	516,229	616,446	100,217	5,222	105,439
2009	966,086	569,158	849,952	280,794	116,134	396,928
2010	676,398	327,938	587,710	259,772	88,688	348,460
2011	1,138,003	711,550	881,631	170,081	256,371	426,452
2012	2,285,175	1,533,202	2,153,132	619,930	132,043	751,973
2013	1,431,323	753,022	1,149,154	396,132	282,169	678,301
2014	914,473	19,091	783,406	764,315	131,067	895,382
2015	999,393	172,789	702,914	530,125	296,479	826,604
2016	1,087,694	145,829	702,006	556,177	385,688	941,864
TOTAL	32,314,736	23,865,421	30,612,069	6,746,648	1,702,667	8,449,315

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Summary of Ultimate Losses

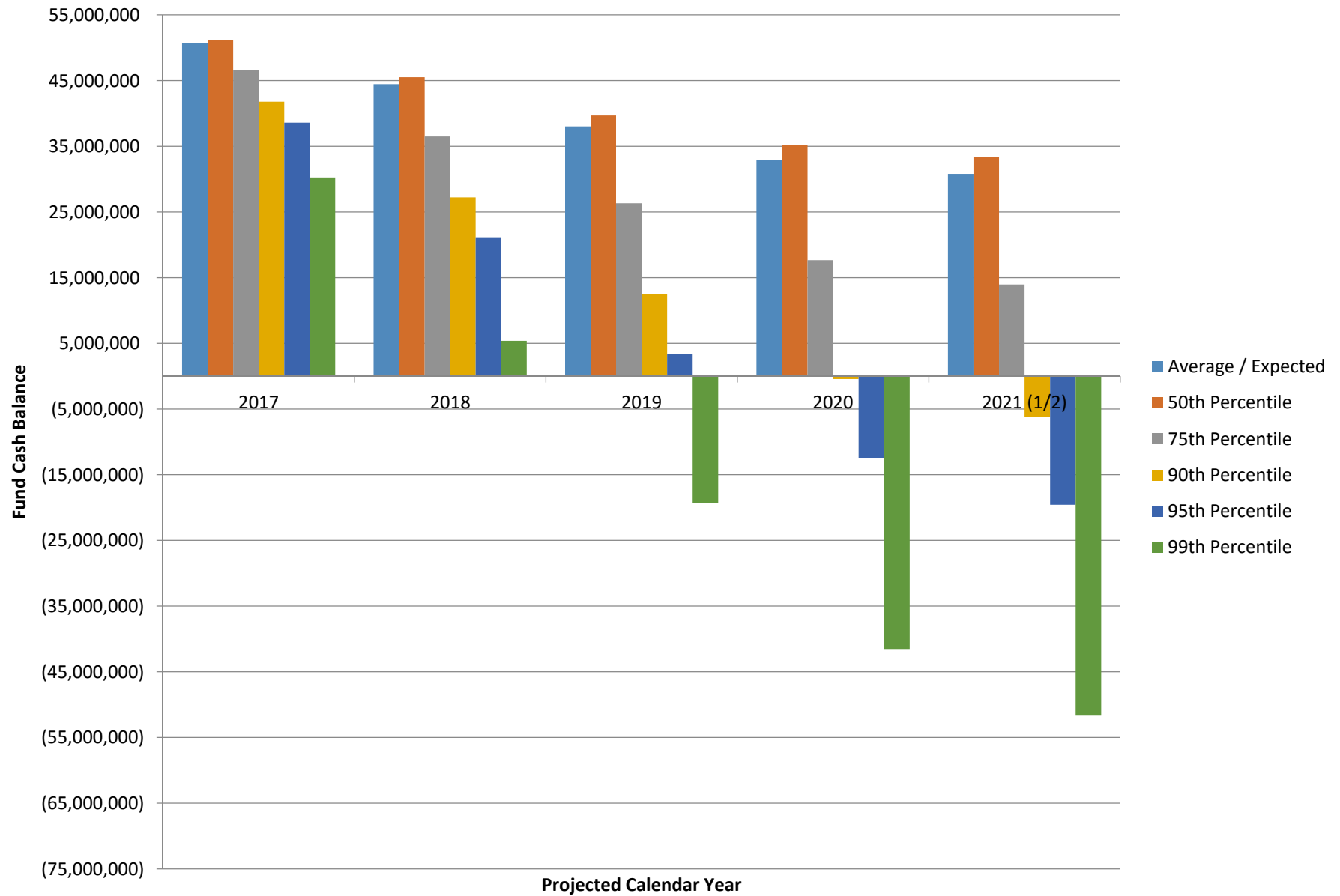
(1) RY	(2) PAID LDM <u>ULTIMATE</u>	(3) INC LDM <u>ULTIMATE</u>	(4) PAID BF <u>ULTIMATE</u>	(5) INC BF <u>ULTIMATE</u>	(7) SELECTED <u>ULTIMATE</u>
1994	-	-	-	-	-
1995	106,826	106,826	-	-	106,826
1996	120,337	119,916	-	-	119,916
1997	-	-	-	-	-
1998	635,092	635,092	-	-	635,092
1999	1,534,041	1,425,054	-	-	1,425,054
2000	5,247,170	5,394,332	-	-	5,394,332
2001	1,659,746	1,712,949	-	-	1,712,949
2002	436,415	479,487	-	-	479,487
2003	629,063	596,638	-	-	596,638
2004	2,161,692	1,969,099	-	-	1,969,099
2005	79,838	92,072	-	-	79,838
2006	-	-	-	-	-
2007	41,750	51,275	-	-	41,750
2008	51,787	68,380	85,264	57,442	51,787
2009	243,961	234,734	146,952	186,002	234,734
2010	-	-	38,902	7,412	-
2011	-	-	42,277	8,155	-
2012	-	-	47,260	9,871	-
2013	-	-	52,519	12,872	-
2014	-	-	58,394	13,693	-
2015	346,908	346,456	123,819	211,772	346,682
2016	-	-	84,008	23,379	53,693
TOTAL	13,294,625	13,232,309	679,396	530,597	13,247,877



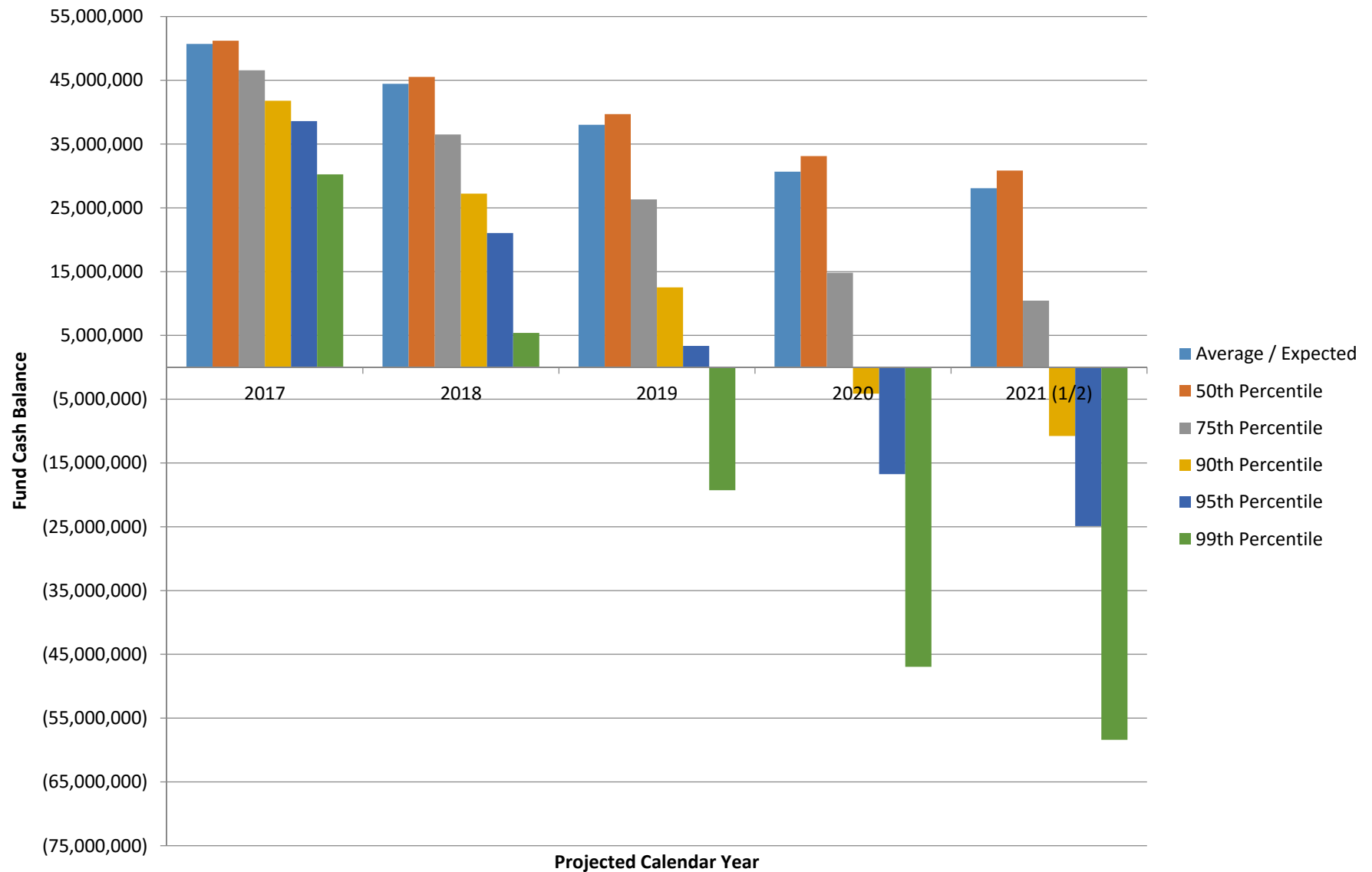
Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Summary of Case & IBNR Reserves

(1) RY	(2) SELECTED <u>ULTIMATE</u>	(3) PAID <u>LOSS</u>	(4) INCURRED <u>LOSS</u>	(5) CASE <u>RESERVE</u>	(6) IBNR <u>RESERVE</u>	(7) UNPAID <u>LOSS</u>
1994	-	-	-	-	-	-
1995	106,826	106,826	106,826	-	-	-
1996	119,916	103,782	119,916	16,134	-	16,134
1997	-	-	-	-	-	-
1998	635,092	635,092	635,092	-	-	-
1999	1,425,054	1,294,320	1,405,690	111,371	19,364	130,734
2000	5,394,332	3,022,541	5,247,170	2,224,629	147,162	2,371,791
2001	1,712,949	955,109	1,659,746	704,637	53,203	757,840
2002	479,487	239,493	436,415	196,922	43,072	239,994
2003	596,638	471,503	552,376	80,873	44,262	125,135
2004	1,969,099	1,554,162	1,818,773	264,611	150,326	414,937
2005	79,838	79,838	79,838	-	-	-
2006	-	-	-	-	-	-
2007	41,750	41,750	41,750	-	-	-
2008	51,787	51,787	51,787	-	-	-
2009	234,734	110,661	179,761	69,100	54,973	124,073
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	346,682	53,789	195,789	142,000	150,893	292,893
2016	53,693	-	-	-	53,693	53,693
TOTAL	13,247,877	8,720,651	12,530,928	3,810,277	716,949	4,527,225

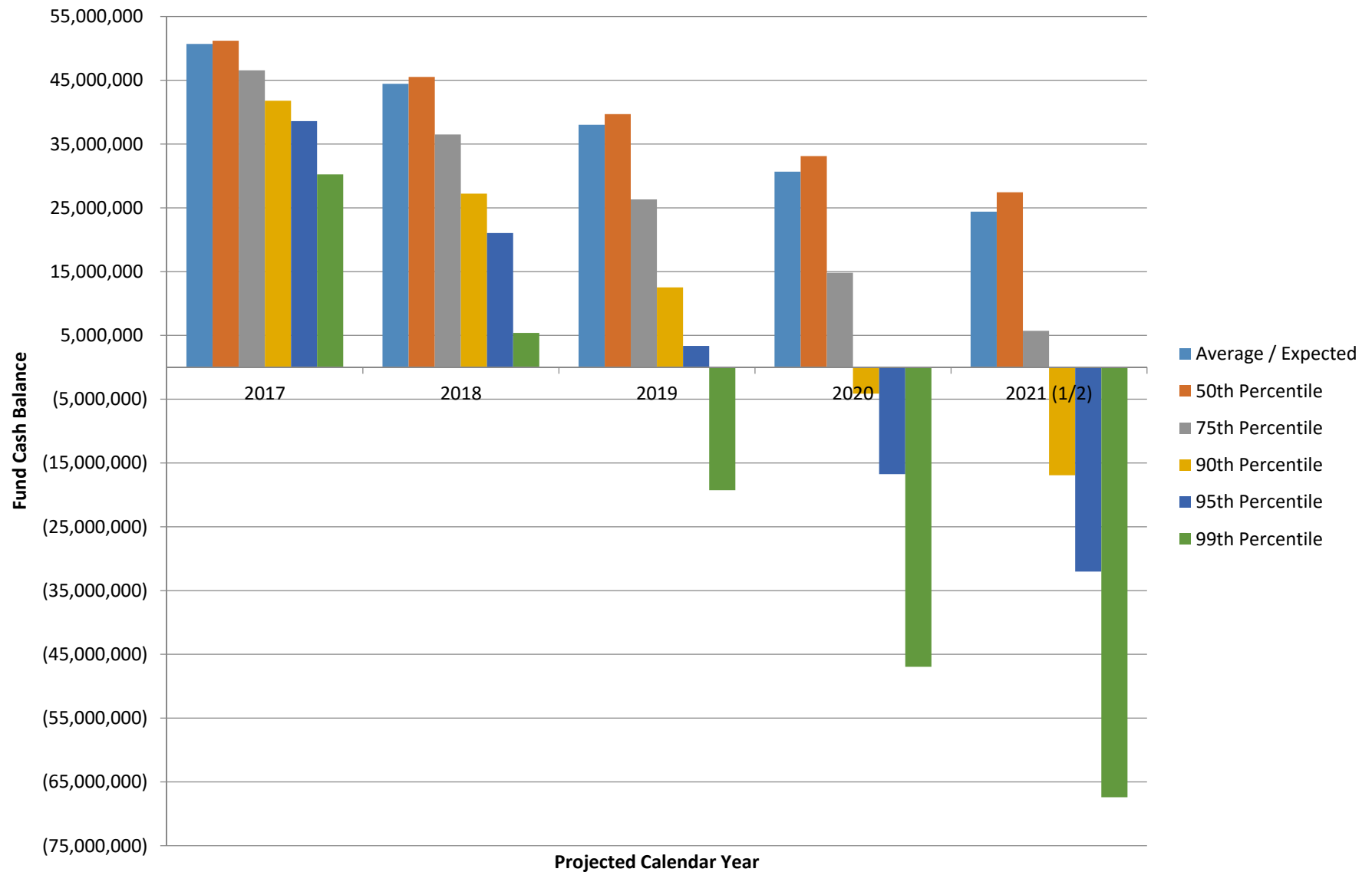
## Projected Cash Balance by Calendar Year at Confidence Levels



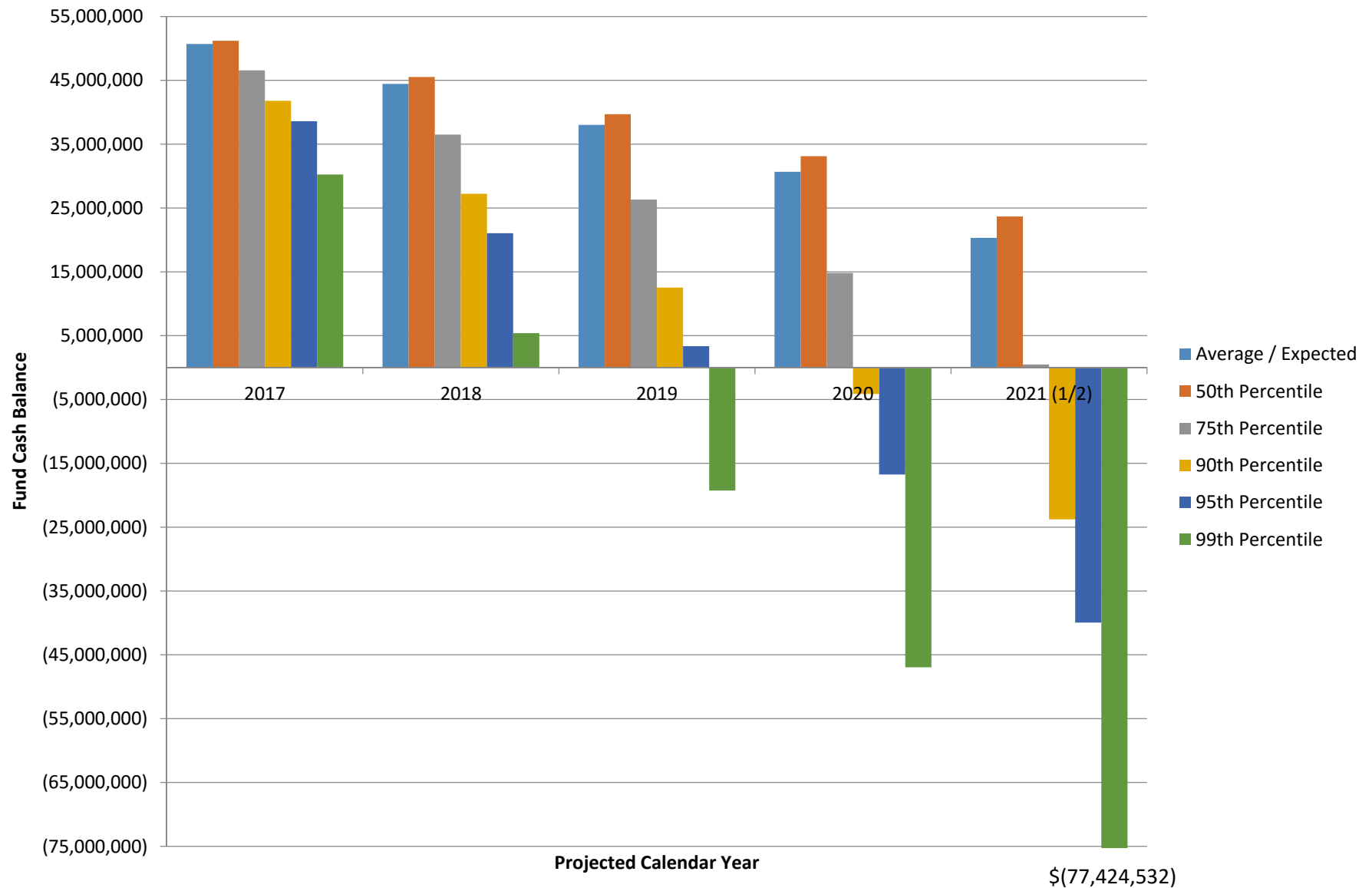
## Projected Cash Balance by Calendar Year at Confidence Levels with Increased Claim Activity due to Fund Sunset; Low Scenario



## Projected Cash Balance by Calendar Year at Confidence Levels with Increased Claim Activity due to Fund Sunset; Middle Scenario



## Projected Cash Balance by Calendar Year at Confidence Levels with Increased Claim Activity due to Fund Sunset; High Scenario



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
Financial Projections Based on PSTIF 2016 Projections

	(A) Annual Revenues Fiscal Year:	(B) 2017	(C) 2018	(D) 2019	(E) 2020	(F) 2021 (1/2)	(G) Totals
(1)	Transport load fees	11,250,000	11,200,000	11,150,000	11,100,000	5,525,000	50,225,000
(2)	100 Initial tank fees	18,000	18,000	18,000	18,000	9,000	81,000
(3)	UST participation fees	905,000	901,710	898,420	895,130	445,920	4,046,180
(4)	AST participation fees	355,000	355,000	355,000	355,000	177,500	1,597,500
(5)	Interest income	285,000	278,819	244,478	209,134	90,376	1,107,807
(6)	Total Revenues	12,813,000	12,753,529	12,665,898	12,577,264	6,247,796	57,057,487
	Administrative Expenses Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,300,000	2,254,000	2,208,920	2,164,742	1,060,723	9,988,385
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	45,000	405,000
(9)	Office of Administration	79,248	81,625	84,074	86,596	44,597	376,141
(10)	Section 319.107 Expenses	15,000	15,450	15,914	16,391	8,441	71,196
(11)	Underwriting	365,000	375,950	387,229	398,845	205,405	1,732,429
(12)	Inspections	379,689	391,080	402,812	414,896	213,672	1,802,149
(13)	Training & Loss Prevention Services	25,000	25,750	26,523	27,318	14,069	118,660
(14)	Other Professional Expenses	598,970	616,939	635,447	654,511	337,073	2,842,940
(15)	Legal Expenses	70,000	72,100	74,263	76,491	39,393	332,247
(16)	Department of Revenue	43,090	44,383	45,714	47,086	24,249	204,522
(17)	Attorney General's Office	120,194	123,800	127,514	131,339	67,640	570,487
(18)	PSTIF Board/Staff	200,000	206,000	212,180	218,545	112,551	949,276
(19)	Department of Natural Resources	1,429,131	1,472,005	1,516,165	1,561,650	804,250	6,783,201
(20)	Total Administrative Expenses	5,715,322	5,769,082	5,826,754	5,888,411	2,977,063	26,176,631
	Claim Payments Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(21)	Average / Expected	14,147,469	13,228,354	13,265,267	11,849,172	5,327,908	57,818,170
(22)	50th Percentile Losses	13,636,226	12,670,880	12,658,908	11,243,796	5,029,963	55,239,774
(23)	75th Percentile Losses	18,283,368	17,038,459	17,017,051	15,349,620	6,966,252	74,654,749
(24)	90th Percentile Losses	23,049,548	21,541,268	21,543,870	19,653,620	9,003,100	94,791,405
(25)	95th Percentile Losses	26,239,476	24,535,687	24,544,061	22,519,486	10,364,644	108,203,354
(26)	99th Percentile Losses	34,584,964	31,855,819	31,489,074	28,961,195	13,418,722	140,309,773
(27)	Cash balance @ 6/30/16	57,744,191					
	Funds Available at Fiscal Year-End:	2017	2018	2019	2020	2021 (1/2)	
(28)	Average / Expected	50,694,400	44,450,494	38,024,371	32,864,052	30,806,877	
(29)	50th Percentile	51,205,643	45,519,210	39,699,446	35,144,503	33,385,273	
(30)	75th Percentile	46,558,501	36,504,490	26,326,583	17,665,817	13,970,298	
(31)	90th Percentile	41,792,321	27,235,501	12,530,775	(433,991)	(6,166,359)	
(32)	95th Percentile	38,602,393	21,051,153	3,346,236	(12,484,397)	(19,578,307)	
(33)	99th Percentile	30,256,905	5,385,534	(19,264,396)	(41,536,738)	(51,684,727)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

Missouri Petroleum Storage Tank Insurance Fund

Reserve Study as of June 30, 2016

All Claim Types

Financial Projections Based on PSTIF 2016 Projections w/Increased Activity due to Sunset, Low Scenario

	(A) Annual Revenues Fiscal Year:	(B) 2017	(C) 2018	(D) 2019	(E) 2020	(F) 2021 (1/2)	(G) Totals
(1)	Transport load fees	11,250,000	11,200,000	11,150,000	11,100,000	5,525,000	50,225,000
(2)	100 Initial tank fees	18,000	18,000	18,000	18,000	9,000	81,000
(3)	UST participation fees	905,000	901,710	898,420	895,130	445,920	4,046,180
(4)	AST participation fees	355,000	355,000	355,000	355,000	177,500	1,597,500
(5)	Interest income	285,000	278,819	244,478	209,134	90,376	1,107,807
(6)	Total Revenues	12,813,000	12,753,529	12,665,898	12,577,264	6,247,796	57,057,487
	Administrative Expenses Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,300,000	2,254,000	2,208,920	2,164,742	1,060,723	9,988,385
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	45,000	405,000
(9)	Office of Administration	79,248	81,625	84,074	86,596	44,597	376,141
(10)	Section 319.107 Expenses	15,000	15,450	15,914	16,391	8,441	71,196
(11)	Underwriting	365,000	375,950	387,229	398,845	205,405	1,732,429
(12)	Inspections	379,689	391,080	402,812	414,896	213,672	1,802,149
(13)	Training & Loss Prevention Services	25,000	25,750	26,523	27,318	14,069	118,660
(14)	Other Professional Expenses	598,970	616,939	635,447	654,511	337,073	2,842,940
(15)	Legal Expenses	70,000	72,100	74,263	76,491	39,393	332,247
(16)	Department of Revenue	43,090	44,383	45,714	47,086	24,249	204,522
(17)	Attorney General's Office	120,194	123,800	127,514	131,339	67,640	570,487
(18)	PSTIF Board/Staff	200,000	206,000	212,180	218,545	112,551	949,276
(19)	Department of Natural Resources	1,429,131	1,472,005	1,516,165	1,561,650	804,250	6,783,201
(20)	Total Administrative Expenses	5,715,322	5,769,082	5,826,754	5,888,411	2,977,063	26,176,631
	Claim Payments Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(21)	Average / Expected	14,147,469	13,228,354	13,265,267	14,043,468	5,866,376	60,550,933
(22)	50th Percentile Losses	13,636,226	12,670,880	12,658,908	13,281,113	5,527,497	57,774,624
(23)	75th Percentile Losses	18,283,368	17,038,459	17,017,051	18,186,764	7,649,707	78,175,348
(24)	90th Percentile Losses	23,049,548	21,541,268	21,543,870	23,351,474	9,898,431	99,384,590
(25)	95th Percentile Losses	26,239,476	24,535,687	24,544,061	26,786,088	11,402,931	113,508,243
(26)	99th Percentile Losses	34,584,964	31,855,819	31,489,074	34,383,752	14,711,199	147,024,808
(27)	Cash balance @ 6/30/16	57,744,191					
	Funds Available at Fiscal Year-End:	2017	2018	2019	2020	2021 (1/2)	
(28)	Average / Expected	50,694,400	44,450,494	38,024,371	30,669,756	28,074,113	
(29)	50th Percentile	51,205,643	45,519,210	39,699,446	33,107,186	30,850,422	
(30)	75th Percentile	46,558,501	36,504,490	26,326,583	14,828,672	10,449,698	
(31)	90th Percentile	41,792,321	27,235,501	12,530,775	(4,131,846)	(10,759,543)	
(32)	95th Percentile	38,602,393	21,051,153	3,346,236	(16,750,999)	(24,883,196)	
(33)	99th Percentile	30,256,905	5,385,534	(19,264,396)	(46,959,295)	(58,399,762)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

Missouri Petroleum Storage Tank Insurance Fund

Reserve Study as of June 30, 2016

All Claim Types

Financial Projections Based on PSTIF 2016 Projections w/Increased Activity due to Sunset, Middle Scenario

	(A) Annual Revenues Fiscal Year:	(B) 2017	(C) 2018	(D) 2019	(E) 2020	(F) 2021 (1/2)	(G) Totals
(1)	Transport load fees	11,250,000	11,200,000	11,150,000	11,100,000	5,525,000	50,225,000
(2)	100 Initial tank fees	18,000	18,000	18,000	18,000	9,000	81,000
(3)	UST participation fees	905,000	901,710	898,420	895,130	445,920	4,046,180
(4)	AST participation fees	355,000	355,000	355,000	355,000	177,500	1,597,500
(5)	Interest income	285,000	278,819	244,478	209,134	90,376	1,107,807
(6)	Total Revenues	12,813,000	12,753,529	12,665,898	12,577,264	6,247,796	57,057,487
	Administrative Expenses Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,300,000	2,254,000	2,208,920	2,164,742	1,060,723	9,988,385
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	45,000	405,000
(9)	Office of Administration	79,248	81,625	84,074	86,596	44,597	376,141
(10)	Section 319.107 Expenses	15,000	15,450	15,914	16,391	8,441	71,196
(11)	Underwriting	365,000	375,950	387,229	398,845	205,405	1,732,429
(12)	Inspections	379,689	391,080	402,812	414,896	213,672	1,802,149
(13)	Training & Loss Prevention Services	25,000	25,750	26,523	27,318	14,069	118,660
(14)	Other Professional Expenses	598,970	616,939	635,447	654,511	337,073	2,842,940
(15)	Legal Expenses	70,000	72,100	74,263	76,491	39,393	332,247
(16)	Department of Revenue	43,090	44,383	45,714	47,086	24,249	204,522
(17)	Attorney General's Office	120,194	123,800	127,514	131,339	67,640	570,487
(18)	PSTIF Board/Staff	200,000	206,000	212,180	218,545	112,551	949,276
(19)	Department of Natural Resources	1,429,131	1,472,005	1,516,165	1,561,650	804,250	6,783,201
(20)	Total Administrative Expenses	5,715,322	5,769,082	5,826,754	5,888,411	2,977,063	26,176,631
	Claim Payments Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(21)	Average / Expected	14,147,469	13,228,354	13,265,267	14,043,468	9,541,330	64,225,887
(22)	50th Percentile Losses	13,636,226	12,670,880	12,658,908	13,281,113	8,930,565	61,177,693
(23)	75th Percentile Losses	18,283,368	17,038,459	17,017,051	18,186,764	12,370,745	82,896,387
(24)	90th Percentile Losses	23,049,548	21,541,268	21,543,870	23,351,474	16,066,443	105,552,602
(25)	95th Percentile Losses	26,239,476	24,535,687	24,544,061	26,786,088	18,540,595	120,645,907
(26)	99th Percentile Losses	34,584,964	31,855,819	31,489,074	34,383,752	23,723,916	156,037,524
(27)	Cash balance @ 6/30/16	57,744,191					
	Funds Available at Fiscal Year-End:	2017	2018	2019	2020	2021 (1/2)	
(28)	Average / Expected	50,694,400	44,450,494	38,024,371	30,669,756	24,399,159	
(29)	50th Percentile	51,205,643	45,519,210	39,699,446	33,107,186	27,447,354	
(30)	75th Percentile	46,558,501	36,504,490	26,326,583	14,828,672	5,728,660	
(31)	90th Percentile	41,792,321	27,235,501	12,530,775	(4,131,846)	(16,927,555)	
(32)	95th Percentile	38,602,393	21,051,153	3,346,236	(16,750,999)	(32,020,860)	
(33)	99th Percentile	30,256,905	5,385,534	(19,264,396)	(46,959,295)	(67,412,478)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.



Missouri Petroleum Storage Tank Insurance Fund

Reserve Study as of June 30, 2016

All Claim Types

Financial Projections Based on PSTIF 2016 Projections w/Increased Activity due to Sunset, High Scenario

	(A) Annual Revenues Fiscal Year:	(B) 2017	(C) 2018	(D) 2019	(E) 2020	(F) 2021 (1/2)	(G) Totals
(1)	Transport load fees	11,250,000	11,200,000	11,150,000	11,100,000	5,525,000	50,225,000
(2)	100 Initial tank fees	18,000	18,000	18,000	18,000	9,000	81,000
(3)	UST participation fees	905,000	901,710	898,420	895,130	445,920	4,046,180
(4)	AST participation fees	355,000	355,000	355,000	355,000	177,500	1,597,500
(5)	Interest income	285,000	278,819	244,478	209,134	90,376	1,107,807
(6)	Total Revenues	12,813,000	12,753,529	12,665,898	12,577,264	6,247,796	57,057,487
	Administrative Expenses Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(7)	Third Party Administrative Expenses	2,300,000	2,254,000	2,208,920	2,164,742	1,060,723	9,988,385
(8)	Contingency & Special Projects	90,000	90,000	90,000	90,000	45,000	405,000
(9)	Office of Administration	79,248	81,625	84,074	86,596	44,597	376,141
(10)	Section 319.107 Expenses	15,000	15,450	15,914	16,391	8,441	71,196
(11)	Underwriting	365,000	375,950	387,229	398,845	205,405	1,732,429
(12)	Inspections	379,689	391,080	402,812	414,896	213,672	1,802,149
(13)	Training & Loss Prevention Services	25,000	25,750	26,523	27,318	14,069	118,660
(14)	Other Professional Expenses	598,970	616,939	635,447	654,511	337,073	2,842,940
(15)	Legal Expenses	70,000	72,100	74,263	76,491	39,393	332,247
(16)	Department of Revenue	43,090	44,383	45,714	47,086	24,249	204,522
(17)	Attorney General's Office	120,194	123,800	127,514	131,339	67,640	570,487
(18)	PSTIF Board/Staff	200,000	206,000	212,180	218,545	112,551	949,276
(19)	Department of Natural Resources	1,429,131	1,472,005	1,516,165	1,561,650	804,250	6,783,201
(20)	Total Administrative Expenses	5,715,322	5,769,082	5,826,754	5,888,411	2,977,063	26,176,631
	Claim Payments Fiscal Year:	2017	2018	2019	2020	2021 (1/2)	Totals
(21)	Average / Expected	14,147,469	13,228,354	13,265,267	14,043,468	13,618,851	68,303,408
(22)	50th Percentile Losses	13,636,226	12,670,880	12,658,908	13,281,113	12,701,942	64,949,070
(23)	75th Percentile Losses	18,283,368	17,038,459	17,017,051	18,186,764	17,606,314	88,131,956
(24)	90th Percentile Losses	23,049,548	21,541,268	21,543,870	23,351,474	22,911,200	112,397,359
(25)	95th Percentile Losses	26,239,476	24,535,687	24,544,061	26,786,088	26,472,733	128,578,046
(26)	99th Percentile Losses	34,584,964	31,855,819	31,489,074	34,383,752	33,735,970	166,049,578
(27)	Cash balance @ 6/30/16	57,744,191					
	Funds Available at Fiscal Year-End:	2017	2018	2019	2020	2021 (1/2)	
(28)	Average / Expected	50,694,400	44,450,494	38,024,371	30,669,756	20,321,638	
(29)	50th Percentile	51,205,643	45,519,210	39,699,446	33,107,186	23,675,977	
(30)	75th Percentile	46,558,501	36,504,490	26,326,583	14,828,672	493,091	
(31)	90th Percentile	41,792,321	27,235,501	12,530,775	(4,131,846)	(23,772,312)	
(32)	95th Percentile	38,602,393	21,051,153	3,346,236	(16,750,999)	(39,952,999)	
(33)	99th Percentile	30,256,905	5,385,534	(19,264,396)	(46,959,295)	(77,424,532)	

Notes: Rows (1) through (18) from Financial Projections provided by PSTIF with some minor differences due to rounding.

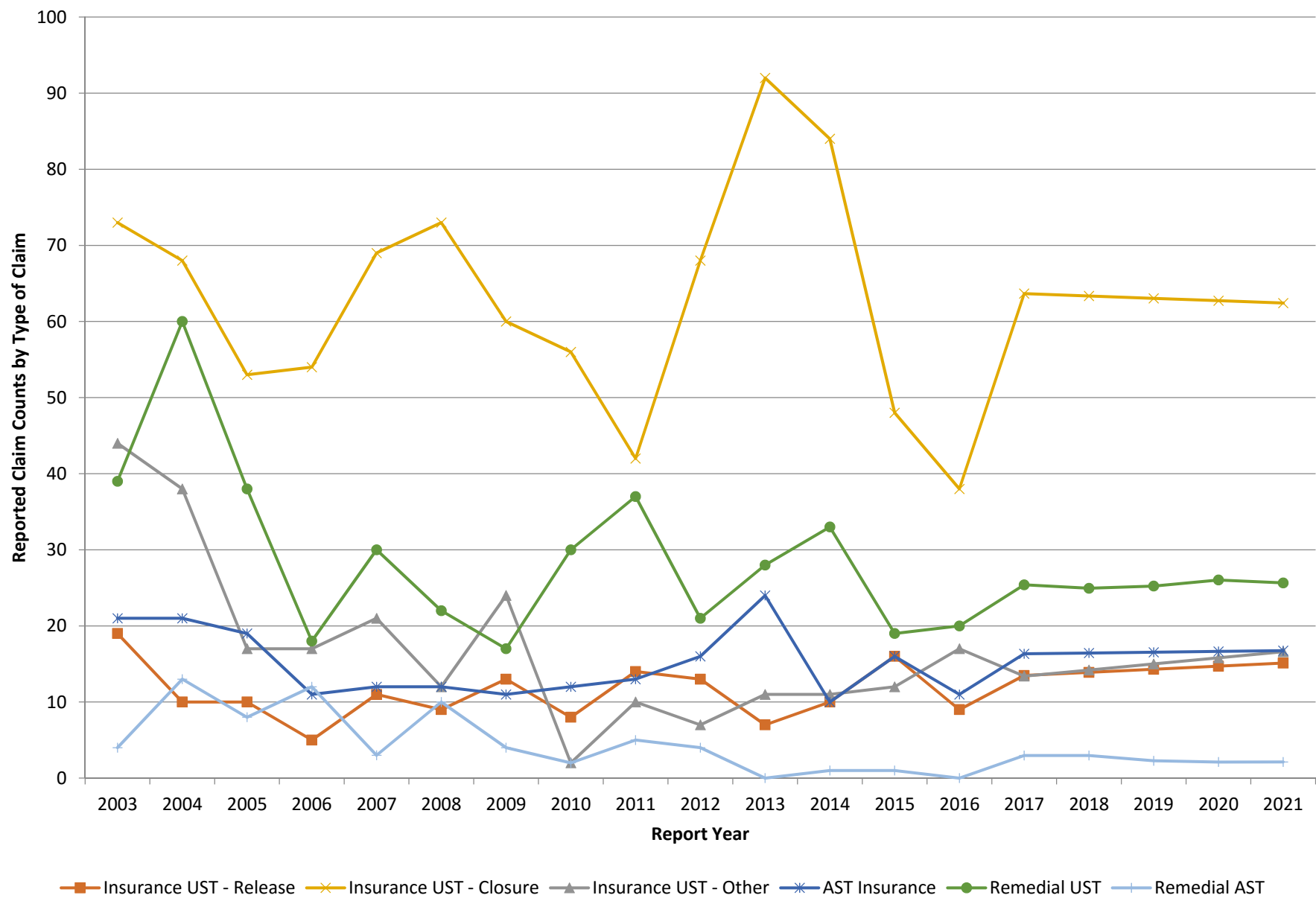
Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
Financial Projection Cash Flow Detail

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
<b>Claim Payments Arising from Current Reserves (Report Years 2016 and Prior)</b>							
		2017	2018	2019	2020	2021	Totals
(1)	50th Percentile Losses	13,200,208	10,819,227	9,914,870	7,801,319	5,985,292	47,720,916
(2)	75th Percentile Losses	17,664,645	14,441,187	13,174,980	10,542,737	8,258,215	64,081,765
(3)	90th Percentile Losses	22,222,181	18,154,638	16,524,553	13,368,030	10,610,493	80,879,895
(4)	95th Percentile Losses	25,283,326	20,647,784	18,773,225	15,266,543	12,196,083	92,166,961
(5)	99th Percentile Losses	33,358,368	26,919,905	24,173,564	19,769,625	15,992,329	120,213,790
(6)	Mean	13,666,839	11,225,132	10,301,379	8,134,596	6,267,226	49,595,172

<b>Claim Payments Arising from Future Claims (Report Years 2016 and After)</b>							
		2017	2018	2019	2020	2021	Totals
(7)	50th Percentile Losses	436,018	1,851,653	2,744,037	3,442,478	4,074,634	12,548,821
(8)	75th Percentile Losses	618,722	2,597,271	3,842,070	4,806,883	5,674,289	17,539,236
(9)	90th Percentile Losses	827,367	3,386,630	5,019,316	6,285,590	7,395,708	22,914,611
(10)	95th Percentile Losses	956,150	3,887,903	5,770,836	7,252,943	8,533,204	26,401,036
(11)	99th Percentile Losses	1,226,596	4,935,914	7,315,510	9,191,571	10,845,115	33,514,705
(12)	Mean	480,630	2,003,222	2,963,887	3,714,576	4,388,591	13,550,907

<b>Total Projected Claim Payments</b>							
		2017	2018	2019	2020	2021	Totals
(13)	50th Percentile Losses	13,636,226	12,670,880	12,658,908	11,243,796	10,059,926	60,269,737
(14)	75th Percentile Losses	18,283,368	17,038,459	17,017,051	15,349,620	13,932,504	81,621,001
(15)	90th Percentile Losses	23,049,548	21,541,268	21,543,870	19,653,620	18,006,201	103,794,506
(16)	95th Percentile Losses	26,239,476	24,535,687	24,544,061	22,519,486	20,729,287	118,567,997
(17)	99th Percentile Losses	34,584,964	31,855,819	31,489,074	28,961,195	26,837,444	153,728,495
(18)	Mean	14,147,469	13,228,354	13,265,267	11,849,172	10,655,817	63,146,078

## Projected Reported Claim Counts by Claim Type



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST Claims  
Projection of Future Frequencies and Severities

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
RY	UST POLS IN FORCE	REPORTED CLAIM COUNTS			ULTIMATE LOSS SEVERITY			ULTIMATE LOSSES		
		RELEASE	CLOSURE	OTHER	RELEASE	CLOSURE	OTHER	RELEASE	CLOSURE	OTHER
1994		3	15	56	83,404	58,397	56,121	250,213	875,960	3,142,787
1995		6	34	39	40,326	24,430	74,460	241,953	830,629	2,903,930
1996		12	84	31	113,834	46,281	76,826	1,366,007	3,887,596	2,381,593
1997		22	126	28	97,077	37,248	136,010	2,135,701	4,693,260	3,808,289
1998		19	161	38	70,582	32,901	79,594	1,341,060	5,297,002	3,024,567
1999		8	226	20	17,822	44,485	145,604	142,573	10,053,616	2,912,071
2000		26	90	59	84,605	63,647	69,935	2,199,740	5,728,207	4,126,171
2001		23	65	36	47,617	35,424	32,140	1,095,194	2,302,577	1,157,042
2002		20	68	47	35,351	67,319	97,996	707,027	4,577,689	4,605,811
2003		19	73	44	110,501	44,463	81,208	2,099,512	3,245,820	3,573,153
2004		10	68	38	121,669	36,091	128,873	1,216,688	2,454,184	4,897,180
2005		10	53	17	95,961	48,952	123,312	959,613	2,594,441	2,096,300
2006		5	54	17	43,741	28,674	192,069	218,704	1,548,385	3,265,175
2007		11	69	21	228,566	59,341	51,108	2,514,222	4,094,514	1,073,261
2008	2,664	9	73	12	227,997	42,687	207,673	2,051,974	3,116,186	2,492,079
2009	2,662	13	60	24	104,921	39,601	54,611	1,363,973	2,376,033	1,310,658
2010	2,622	8	56	2	44,679	36,552	171,472	357,430	2,046,917	342,944
2011	2,623	14	42	10	168,352	50,736	161,244	2,356,929	2,130,914	1,612,443
2012	2,617	13	68	7	102,076	44,730	167,759	1,326,993	3,041,618	1,174,312
2013	2,603	7	92	11	42,022	35,325	111,881	294,155	3,249,875	1,230,692
2014	2,573	10	84	11	199,599	35,495	70,469	1,995,990	2,981,606	775,156
2015	2,530	16	48	12	133,865	42,799	208,675	2,141,843	2,054,330	2,504,103
2016	2,509	9	38	17	133,282	45,342	122,225	1,199,540	1,722,999	2,077,823
2017	2,517	13	64	13	155,086	40,585	155,771	2,091,667	2,583,865	2,087,329
2018	2,500	14	63	14	159,999	40,251	159,359	2,223,007	2,550,094	2,262,901
2019	2,483	14	63	15	164,911	39,917	162,948	2,358,342	2,516,530	2,444,215
2020	2,465	15	63	16	169,824	39,583	166,536	2,497,675	2,483,174	2,631,270
2021	2,448	15	62	17	174,737	39,249	170,124	2,641,004	2,450,026	2,824,066

Notes: Future RYs for Cols (2), (6), (7), and (8) are linearly interpolated against report year.  
Future RYs for Cols (3), (4), and (5) are linearly interpolated against Col (2).  
Col (9) = (3) x (6); Col (10) = (4) x (7); Col (11) = (5) x (8).

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST Claims  
Projection of Future Frequencies and Severities

(1)	(2)	(3)	(4)	(5)
<u>RY</u>	<u>AST POLS IN FORCE</u>	<u>REPORTED CLAIMS</u>	<u>ULTIMATE SEVERITY</u>	<u>ULTIMATE LOSS</u>
1994		-	-	-
1995		-	-	-
1996		-	-	-
1997		-	-	-
1998		1	478,042	478,042
1999		7	384,176	2,689,230
2000		13	91,984	1,195,793
2001		24	263,277	6,318,643
2002		18	124,158	2,234,838
2003		21	72,053	1,513,116
2004		21	136,275	2,861,780
2005		19	88,035	1,672,674
2006		11	183,112	2,014,231
2007		12	101,348	1,216,178
2008	517	12	51,806	621,668
2009	563	11	87,826	966,086
2010	578	12	56,367	676,398
2011	810	13	87,539	1,138,003
2012	975	16	142,823	2,285,175
2013	1,003	24	59,638	1,431,323
2014	1,030	10	91,447	914,473
2015	1,021	16	62,462	999,393
2016	1,010	11	98,881	1,087,694
2017	1,020	16	81,708	1,334,668
2018	1,030	16	81,599	1,341,231
2019	1,041	17	81,490	1,347,856
2020	1,051	17	81,381	1,354,542
2021	1,062	17	81,272	1,361,290

Notes: Future RYs for Col (2) are increased by a decreasing percentage to a maximum of 1,100 based on assumptions from PSTIF.  
Future RYs for Col (3) are linearly interpolated against Col (2).  
Col (5) = (3) x (4).

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial Claims  
Projection of Future Frequencies and Severities

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	POTENTIAL SITES		REPORTED CLAIM COUNTS		% REPORTED ON PREV YR		ULTIMATE LOSS SEVERITY		ULTIMATE LOSS	
RY	UST	AST	UST	AST	UST	AST	UST	AST	UST	AST
1994	15,480	2,403	-	-	-	-	-	-	-	-
1995	15,479	2,402	1	1	0.01%	0.04%	114,027	106,826	114,027	106,826
1996	14,166	2,399	1,313	3	8.48%	0.12%	50,381	39,972	66,150,233	119,916
1997	13,952	2,399	214	-	1.51%	0.00%	40,333	-	8,631,269	-
1998	13,633	2,387	319	12	2.29%	0.50%	59,311	52,924	18,920,310	635,092
1999	13,255	2,376	378	11	2.77%	0.46%	21,914	129,550	8,283,616	1,425,054
2000	12,696	2,327	559	49	4.22%	2.06%	26,963	110,088	15,072,191	5,394,332
2001	12,354	2,123	342	204	2.69%	8.77%	8,061	8,397	2,756,881	1,712,949
2002	12,228	2,105	126	18	1.02%	0.85%	28,085	26,638	3,538,667	479,487
2003	12,189	2,101	39	4	0.32%	0.19%	31,468	149,159	1,227,240	596,638
2004	12,129	2,088	60	13	0.49%	0.62%	31,492	151,469	1,889,495	1,969,099
2005	12,091	2,080	38	8	0.31%	0.38%	78,746	9,980	2,992,338	79,838
2006	12,073	2,068	18	12	0.15%	0.58%	27,038	-	486,679	-
2007	12,043	2,065	30	3	0.25%	0.15%	45,831	13,917	1,374,928	41,750
2008	12,021	2,055	22	10	0.18%	0.48%	32,460	5,179	714,124	51,787
2009	12,004	2,051	17	4	0.14%	0.19%	50,875	58,684	864,870	234,734
2010	11,974	2,049	30	2	0.25%	0.10%	31,219	-	936,573	-
2011	11,937	2,044	37	5	0.31%	0.24%	43,755	-	1,618,938	-
2012	11,916	2,040	21	4	0.18%	0.20%	30,184	-	633,861	-
2013	11,888	2,040	28	-	0.23%	0.00%	38,629	-	1,081,621	-
2014	11,855	2,039	33	1	0.28%	0.05%	28,278	-	933,180	-
2015	11,836	2,038	19	1	0.16%	0.05%	31,378	346,682	596,187	346,682
2016	11,816	2,038	20	-	0.17%	0.00%	34,642	-	692,839	-
2017	11,791	2,035	25	3	0.21%	0.15%	38,481	52,585	977,250	156,389
2018	11,766	2,032	25	3	0.21%	0.15%	38,481	52,585	959,921	156,252
2019	11,740	2,030	25	2	0.21%	0.11%	38,481	52,585	970,970	119,880
2020	11,714	2,028	26	2	0.22%	0.10%	38,481	52,585	1,001,886	110,944
2021	11,689	2,026	26	2	0.22%	0.10%	38,481	52,585	986,972	111,514

Notes: Future RYs for Cols (2) and (3) are [prior year sites] x (1 - [% reported from col (6) or (7)])  
Future RYs for Cols (4) and (5) are the change in Cols (2) and (3), respectively.  
Future RYs for Cols (6) and (7) are rolling average of prior 10 years.  
Future RYs for Cols (8) and (9) are long-term averages from 1995-2015

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
Cash Flow Summary

**UNDISCOUNTED VALUE OF CURRENT RESERVES - PAYMENT STREAM**

<u>Category</u>	<u>Total</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>After 2025</u>
Insurance UST - Release	10,049,435	1,292,695	1,068,454	1,026,989	901,029	782,842	633,338	706,479	715,662	561,830	2,360,116
Insurance UST - Closure	16,875,576	2,697,129	2,057,050	1,673,483	1,491,334	1,263,885	1,198,079	1,003,300	811,245	705,815	3,974,256
Insurance UST - Other	17,362,353	2,405,535	2,195,327	1,873,545	1,630,614	1,504,593	1,224,620	1,103,353	945,217	846,867	3,632,683
Remedial UST	24,627,918	4,951,615	4,320,369	4,522,009	3,082,804	1,803,636	1,406,410	1,060,981	795,143	527,310	2,157,641
Insurance AST	8,449,315	1,152,143	879,037	781,183	719,608	634,908	606,534	583,933	585,178	539,394	1,967,397
Remedial AST	4,527,225	1,167,723	704,894	424,169	309,207	277,363	254,835	591,056	424,147	146,475	227,357
Total	81,891,823	13,666,839	11,225,132	10,301,379	8,134,596	6,267,226	5,323,816	5,049,103	4,276,592	3,327,691	14,319,450
Percent of Current Total											
Paid by Year - Undiscounted	100.0%	16.7%	13.7%	12.6%	9.9%	7.7%	6.5%	6.2%	5.2%	4.1%	17.5%

**DISCOUNTED VALUE OF CURRENT RESERVES - PAYMENT STREAM**

<u>Category</u>	<u>Total</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>After 2025</u>
Insurance UST - Release	9,722,545	1,289,154	1,059,700	1,013,003	883,897	763,756	614,518	681,735	686,819	536,238	2,193,725
Insurance UST - Closure	16,349,470	2,689,743	2,040,195	1,650,693	1,462,977	1,233,071	1,162,476	968,161	778,550	673,664	3,689,940
Insurance UST - Other	16,840,311	2,398,947	2,177,339	1,848,029	1,599,609	1,467,911	1,188,228	1,064,710	907,122	808,291	3,380,126
Remedial UST	24,128,775	4,938,054	4,284,969	4,460,425	3,024,187	1,759,664	1,364,617	1,023,821	763,097	503,290	2,006,652
Insurance AST	8,175,808	1,148,987	871,835	770,544	705,925	619,429	588,510	563,481	561,594	514,824	1,830,679
Remedial AST	4,433,120	1,164,525	699,119	418,393	303,328	270,601	247,262	570,355	407,052	139,802	212,683
Total	79,650,030	13,629,409	11,133,157	10,161,087	7,979,924	6,114,430	5,165,610	4,872,263	4,104,235	3,176,108	13,313,805
Percent of Current Total											
Paid by Year - Discounted	100.0%	17.1%	14.0%	12.8%	10.0%	7.7%	6.5%	6.1%	5.2%	4.0%	16.7%

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
ALAE Provision

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>RY</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>ALAE</u>	<u>ALAE PER \$10K</u> <u>INCURRED</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u>	<u>ALAE</u> <u>UNPAID</u>	<u>ULTIMATE</u> <u>ALAE</u>
1994	3,702,345	4,268,960	6,347	14.87	566,615	-	1,297	7,644
1995	4,105,319	4,177,131	9,365	22.42	71,812	20,234	257	9,622
1996	65,236,141	73,868,188	124,218	16.82	8,632,047	37,158	19,931	144,150
1997	17,613,238	19,145,997	41,416	21.63	1,532,759	122,522	4,070	45,486
1998	25,861,796	29,272,099	79,968	27.32	3,410,303	423,973	9,748	89,716
1999	22,626,735	25,004,934	73,971	29.58	2,378,199	501,226	7,739	81,710
2000	26,405,253	32,557,772	76,936	23.63	6,152,519	1,158,662	19,390	96,326
2001	12,139,436	15,001,325	49,896	33.26	2,861,890	341,960	8,117	58,013
2002	12,406,480	15,304,910	43,453	28.39	2,898,430	838,609	10,475	53,928
2003	9,401,284	11,464,882	51,805	45.19	2,063,599	790,596	8,344	60,149
2004	12,237,842	14,154,561	132,740	93.78	1,916,719	1,133,865	9,579	142,319
2005	7,872,390	9,683,017	105,340	108.79	1,810,627	712,188	7,406	112,746
2006	5,030,814	6,842,669	61,548	89.95	1,811,855	690,505	7,309	68,858
2007	8,292,318	9,483,771	96,648	101.91	1,191,453	831,082	6,533	103,180
2008	6,346,011	7,937,510	36,610	46.12	1,591,498	1,110,307	8,727	45,337
2009	4,636,640	5,884,116	28,240	47.99	1,247,476	1,232,239	8,498	36,738
2010	2,395,420	3,866,746	25,591	66.18	1,471,326	493,515	5,628	31,219
2011	4,813,019	7,426,651	27,559	37.11	2,613,632	1,430,576	12,533	40,093
2012	4,319,870	6,889,250	28,216	40.96	2,569,379	1,572,709	13,083	41,299
2013	3,386,614	5,818,112	23,765	40.85	2,431,498	1,469,554	12,295	36,060
2014	2,809,553	5,674,627	21,978	38.73	2,865,074	1,925,778	15,376	37,354
2015	2,167,494	5,721,288	33,390	58.36	3,553,794	2,921,250	21,511	54,901
2016	343,777	2,961,132	9,599	32.42	2,617,355	3,873,456	23,727	33,326
TOTAL ALL YEARS	264,149,789	322,409,649	1,188,599	36.87	58,259,861	23,631,963	241,575	1,430,174
TOTAL 2008-2015	30,874,622	49,218,301	225,350	45.79				
			<b>SELECTED RATIO</b>		<b>45.79</b>			

Notes:

Col (5) = (4) / (3) \* 10,000

Col (8) = [(6) x 50% + (7)] x Selected Ratio / 10,000

Col (9) = (8) + (4)



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
All Claim Types  
ULAE Provision

(1)	(2)	(3)	(4)	(5)	(6)
FISCAL	TPA FIXED	TPA TOTAL	TPA	FY	AVERAGE
<u>YEAR</u>	<u>FEES</u>	<u>FEES</u>	VARIABLE FEES	PAID	FEES PER
			<u>(3) - (2)</u>	<u>LOSS</u>	<u>CY PAID</u>
2004	467,640	2,451,360	1,983,720	13,739,514	0.178
2005	493,920	2,777,240	2,283,320	13,395,111	0.207
2006	506,760	2,895,762	2,389,002	12,847,713	0.225
2007	516,600	3,087,143	2,570,543	12,185,369	0.253
2008	526,440	3,124,118	2,597,678	15,806,387	0.198
2009	536,280	3,456,283	2,920,003	16,148,518	0.214
2010	543,660	3,289,570	2,745,910	14,134,856	0.233
2011	546,060	3,185,415	2,639,355	11,632,025	0.274
2012	546,000	3,188,828	2,642,828	12,461,529	0.256
2013	546,000	3,043,682	2,497,682	10,845,847	0.281
2014	548,730	3,116,377	2,567,647	10,116,592	0.308
2015	553,940	3,207,502	2,653,562	12,588,056	0.255
2016	371,460	3,255,111	2,883,651	13,762,021	0.237
Total	6,703,490	40,078,392	33,374,902	169,663,539	0.236
				(7) 3-Year Average	0.266
				(8) 5-Year Average	0.267
				(9) 10-Year ex. Hi/Lo	0.250
				(10) Selected	0.267
				(11) [50% x Case O/S] + IBNR	52,761,893
				(12) ULAE IBNR = (10) x (11)	14,096,974
				(13) Discount	385,905
				(14) Discounted ULAE IBNR = (12) - (13)	13,711,068

Note: Total Row in Column (6) Reflects a Weighted Average

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>
1994	253,899	253,899	220,213	250,213	30,000	3,686
1995	281,579	241,953	241,953	241,953	-	-
1996	1,271,078	1,366,007	1,082,062	1,366,007	283,944	-
1997	2,343,567	2,343,567	1,976,544	2,135,701	159,157	207,866
1998	1,540,571	1,540,571	1,280,060	1,341,060	61,000	199,511
1999	174,235	142,573	142,573	142,573	-	-
2000	2,118,643	2,199,740	1,715,267	2,199,740	484,473	-
2001	1,224,258	1,224,258	948,559	1,092,066	143,507	132,192
2002	801,183	801,183	607,282	700,590	93,307	100,594
2003	1,977,805	2,077,214	1,497,429	2,077,214	579,785	-
2004	1,122,561	1,199,204	811,449	1,199,204	387,756	-
2005	848,644	940,095	584,630	940,095	355,465	-
2006	158,334	213,084	103,765	213,084	109,319	-
2007	3,608,085	3,608,085	2,174,856	2,424,277	249,422	1,183,808
2008	3,215,928	3,215,928	1,636,341	1,930,604	294,262	1,285,324
2009	1,469,362	1,469,362	688,297	1,247,747	559,450	221,615
2010	443,585	443,585	194,452	316,478	122,026	127,107
2011	3,773,955	3,773,955	1,569,874	1,983,357	413,483	1,790,598
2012	1,153,378	1,153,378	440,068	967,172	527,104	186,206
2013	294,155	294,155	100,842	144,674	43,832	149,481
2014	3,218,876	3,218,876	882,491	1,374,411	491,920	1,844,465
2015	3,100,440	3,100,440	618,928	1,813,304	1,194,377	1,287,135
2016	715,694	715,694	9,664	384,295	374,631	331,399
TOTAL	35,109,814	35,536,804	19,527,598	26,485,817	6,958,219	9,050,988

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Development of Losses to Ultimate

RY	Development Period in Months																ULT						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - ULT
1994				1.000	1.000	1.000	1.000	1.229	1.242	1.000	1.152	1.218	1.191	1.000	1.191	1.041	1.000	1.124	1.149	1.000	1.091	1.131	1.153
1995					1.358	1.591	1.565	1.604	1.133	1.194	1.116	1.134	1.276	1.083	1.109	1.066	1.050	1.000	1.000	1.000	1.000	1.009	1.153
1996	2.098	1.106	1.151	1.889	1.193	1.082	1.122	1.025	1.000	1.272	1.000	1.366	1.049	1.032	1.091	1.082	1.016	1.000	1.044	1.013	1.009	1.009	1.153
1997	2.504	1.377	1.216	1.114	1.250	1.408	1.098	1.091	1.047	1.081	1.048	1.021	1.036	1.015	1.015	1.018	1.008	1.002	1.002	1.009	1.009	1.009	1.153
1998	2.695	1.438	1.290	1.798	1.112	1.037	1.063	1.235	1.015	1.063	1.019	1.007	1.015	1.003	1.024	1.076	1.009	1.044	1.015	1.009	1.009	1.009	1.153
1999		1.280	3.009	1.340	1.304	1.130	1.033	1.000	1.000	1.000	1.051	1.338	1.025	1.000	1.000	1.000	1.000	1.015	1.015	1.009	1.009	1.009	1.153
2000		3.172	1.271	1.381	1.569	1.028	1.029	1.000	1.037	1.008	1.014	1.107	1.052	1.000	1.028	1.040	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2001	9.416	1.820	1.430	1.250	1.084	1.030	1.050	1.160	1.045	1.091	1.000	1.010	1.083	1.052	1.040	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2002	14.784	1.513	1.247	1.168	1.278	1.063	1.032	1.155	1.050	1.057	1.006	1.070	1.047	1.000	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2003	9.260	1.459	1.219	1.132	1.061	1.379	1.212	1.043	1.504	1.098	1.104	1.046	1.043	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2004	1.643	1.382	1.103	1.442	1.231	1.095	1.286	1.072	1.121	1.050	1.255	1.147	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2005	1.066	1.671	5.528	1.293	1.177	1.428	1.189	1.256	1.219	1.137	1.032	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2006		1.000	1.000	6.470	1.171	1.049	1.000	1.000	1.369	1.067	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2007	13.702	1.333	1.254	1.076	1.120	1.072	1.054	1.010	1.170	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2008	1.316	1.096	1.028	1.066	1.055	1.037	1.093	1.135	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2009	4.004	1.255	1.467	1.039	1.050	1.036	1.017	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2010	17.254	1.587	1.461	1.027	1.217	1.072	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2011	5.534	1.347	1.215	1.179	1.094	1.054	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2012	3.464	2.126	1.414	1.190	1.090	1.054	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2013	1.409	1.931	1.151	1.113	1.090	1.054	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2014	19.137	1.226	1.250	1.113	1.090	1.054	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2015	5.264	1.373	1.250	1.113	1.090	1.054	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153
2016	14.784	1.373	1.250	1.113	1.090	1.054	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	-	-	-	43,694	43,694	43,694	43,694	43,694	53,694	66,694	66,694	76,832	93,580	111,486	111,486	132,821	138,273	138,273	155,391	178,532	178,532	194,724	220,213	253,899
1995	-	-	-	-	15,175	20,605	32,780	51,312	82,297	93,282	111,391	124,261	140,954	179,922	194,810	216,027	230,340	241,953	241,953	241,953	241,953	241,953	244,220	281,579
1996	60,606	127,123	140,605	161,781	305,670	364,732	394,527	442,597	453,495	453,495	576,781	576,781	787,820	826,524	853,309	930,849	1,007,552	1,023,213	1,023,213	1,068,112	1,082,062	1,092,203	1,102,438	1,271,078
1997	150,598	377,057	519,125	631,334	703,267	879,004	1,237,696	1,359,105	1,483,423	1,553,597	1,679,250	1,760,677	1,797,439	1,862,946	1,890,296	1,917,996	1,952,890	1,968,351	1,972,764	1,976,544	1,995,067	2,013,764	2,032,636	2,343,567
1998	71,919	193,815	278,696	359,433	646,106	718,507	745,388	792,136	978,580	992,873	1,055,025	1,075,457	1,082,693	1,099,371	1,103,031	1,129,278	1,215,534	1,226,074	1,280,060	1,299,304	1,311,480	1,323,771	1,336,176	1,540,571
1999	-	12,585	16,113	48,483	64,952	84,727	95,744	98,894	98,894	98,894	98,894	103,964	139,096	142,573	142,573	142,573	142,573	142,573	144,772	146,948	148,325	149,715	151,118	174,235
2000	-	140,585	445,902	566,818	782,614	1,228,212	1,262,017	1,298,340	1,298,340	1,346,953	1,357,619	1,376,791	1,524,125	1,603,731	1,603,891	1,649,008	1,715,267	1,733,639	1,760,380	1,786,845	1,805,590	1,820,493	1,837,553	2,118,643
2001	16,703	157,277	286,167	409,158	511,400	554,458	571,001	599,455	695,506	726,601	792,933	792,933	801,191	867,543	912,396	948,559	991,167	1,001,783	1,017,236	1,032,528	1,042,205	1,051,972	1,061,830	1,224,258
2002	9,216	136,257	206,137	257,078	300,195	383,621	407,778	420,844	485,920	509,980	539,053	542,052	580,088	607,282	607,282	620,760	648,643	655,591	665,703	675,711	682,043	688,435	694,887	801,183
2003	21,836	202,209	294,954	359,527	407,049	431,955	595,741	722,007	752,772	1,132,407	1,243,625	1,372,437	1,435,580	1,497,429	1,499,140	1,532,411	1,601,244	1,618,395	1,643,358	1,668,064	1,683,696	1,699,475	1,715,401	1,977,805
2004	71,257	117,103	161,795	178,485	257,392	316,743	346,872	446,145	478,479	536,422	563,361	707,282	811,449	849,910	850,881	869,765	908,833	918,567	932,736	946,759	955,631	964,587	973,626	1,122,561
2005	12,800	13,642	22,790	125,995	162,944	191,715	273,716	325,538	408,831	498,368	566,691	584,630	614,446	642,522	643,256	657,532	687,067	694,426	705,138	715,739	722,446	729,216	736,050	848,644
2006	-	8,947	8,947	8,947	57,884	67,789	71,084	71,084	97,281	103,765	109,076	114,452	119,877	120,014	122,677	128,188	129,561	131,559	133,537	134,789	136,052	137,327	158,334	
2007	58,988	808,267	1,077,402	1,350,931	1,454,130	1,628,782	1,745,892	1,840,192	1,858,776	2,174,856	2,364,585	2,485,606	2,608,120	2,731,740	2,734,862	2,795,557	2,921,129	2,952,416	2,997,957	3,043,027	3,071,545	3,100,330	3,129,384	3,608,085
2008	750,154	987,266	1,081,739	1,111,591	1,185,280	1,249,946	1,296,178	1,417,026	1,636,341	1,938,474	2,107,582	2,215,450	2,324,648	2,434,832	2,437,614	2,491,712	2,603,636	2,631,523	2,672,113	2,712,285	2,737,703	2,763,360	2,789,256	3,215,928
2009	81,174	324,978	407,777	598,236	621,700	652,756	676,540	688,297	747,647	885,692	962,957	1,012,242	1,062,135	1,112,478	1,113,749	1,138,467	1,189,605	1,202,347	1,220,892	1,239,247	1,250,861	1,262,583	1,274,415	1,469,362
2010	3,627	62,582	99,320	145,127	148,993	181,398	194,452	207,790	225,707	267,381	290,707	305,585	320,648	335,846	336,229	343,691	359,130	362,976	368,575	374,116	377,622	381,161	384,733	443,585
2011	134,434	743,915	1,002,304	1,217,775	1,435,417	1,569,874	1,654,364	1,767,844	1,920,279	2,274,838	2,473,290	2,599,874	2,728,020	2,857,323	2,860,589	2,924,074	3,055,418	3,088,145	3,135,778	3,182,921	3,212,749	3,242,857	3,273,248	3,773,955
2012	35,519	123,028	261,546	369,814	440,068	479,778	505,599	540,280	586,867	695,225	755,875	794,561	833,725	873,242	874,240	893,642	933,783	943,784	958,342	972,749	981,865	991,067	1,000,355	1,153,378
2013	32,189	45,369	87,594	100,842	112,234	122,362	128,947	137,792	149,67															

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Selection of Loss Development Factors

RY	Development Period in Months																						
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	
1994				1.000	1.000	1.000	1.000	1.229	1.242	1.000	1.152	1.218	1.191	1.000	1.191	1.041	1.000	1.124	1.149	1.000	1.091	1.131	
1995					1.358	1.591	1.565	1.604	1.133	1.194	1.116	1.134	1.276	1.083	1.109	1.066	1.050	1.000	1.000	1.000	1.000		
1996	2.098	1.106	1.151	1.889	1.193	1.082	1.122	1.025	1.000	1.272	1.000	1.366	1.049	1.032	1.091	1.082	1.016	1.000	1.044	1.013			
1997	2.504	1.377	1.216	1.114	1.250	1.408	1.098	1.091	1.047	1.081	1.048	1.021	1.036	1.015	1.015	1.018	1.008	1.002	1.002				
1998	2.695	1.438	1.290	1.798	1.112	1.037	1.063	1.235	1.015	1.063	1.019	1.007	1.015	1.003	1.024	1.076	1.009	1.044					
1999		1.280	3.009	1.340	1.304	1.130	1.033	1.000	1.000	1.000	1.051	1.338	1.025	1.000	1.000	1.000	1.000	1.000					
2000		3.172	1.271	1.381	1.569	1.028	1.029	1.000	1.037	1.008	1.014	1.107	1.052	1.000	1.028	1.040							
2001	9.416	1.820	1.430	1.250	1.084	1.030	1.050	1.160	1.045	1.091	1.000	1.010	1.083	1.052	1.040								
2002	14.784	1.513	1.247	1.168	1.278	1.063	1.032	1.155	1.050	1.057	1.006	1.070	1.047	1.000									
2003	9.260	1.459	1.219	1.132	1.061	1.379	1.212	1.043	1.504	1.098	1.104	1.046	1.043										
2004	1.643	1.382	1.103	1.442	1.231	1.095	1.286	1.072	1.121	1.050	1.255	1.147											
2005	1.066	1.671	5.528	1.293	1.177	1.428	1.189	1.256	1.219	1.137	1.032												
2006		1.000	1.000	6.470	1.171	1.049	1.000	1.000	1.369	1.067													
2007	13.702	1.333	1.254	1.076	1.120	1.072	1.054	1.010	1.170														
2008	1.316	1.096	1.028	1.066	1.055	1.037	1.093	1.155															
2009	4.004	1.255	1.467	1.039	1.050	1.036	1.017																
2010	17.254	1.587	1.461	1.027	1.217	1.072																	
2011	5.534	1.347	1.215	1.179	1.094																		
2012	3.464	2.126	1.414	1.190																			
2013	1.409	1.931	1.151																				
2014	19.137	1.226																					
2015	5.264																						
VOL WTD 3	7.386	1.387	1.249	1.168	1.090	1.040	1.061	1.071	1.185	1.090	1.122	1.078	1.055	1.015	1.031	1.052	1.008	1.014	1.015	1.009	1.039	1.131	
VOL WTD 5	6.299	1.377	1.308	1.113	1.090	1.054	1.069	1.086	1.244	1.087	1.079	1.075	1.053	1.011	1.024	1.046	1.012	1.016	1.021	1.009	1.039	1.131	
VOL WTD ALL	3.456	1.373	1.250	1.199	1.161	1.110	1.084	1.091	1.118	1.080	1.051	1.080	1.050	1.016	1.037	1.046	1.011	1.016	1.021	1.009	1.039	1.131	
ARITH 3	8.603	1.761	1.260	1.132	1.120	1.048	1.055	1.055	1.253	1.085	1.130	1.088	1.058	1.017	1.023	1.039	1.006	1.015	1.015	1.004	1.045	1.131	
ARITH 5	6.961	1.643	1.342	1.100	1.107	1.053	1.071	1.099	1.277	1.082	1.079	1.076	1.050	1.011	1.021	1.043	1.017	1.034	1.049	1.004	1.045	1.131	
ARITH ALL	6.738	1.532	1.581	1.547	1.185	1.149	1.115	1.136	1.139	1.086	1.066	1.133	1.082	1.021	1.062	1.046	1.014	1.034	1.049	1.004	1.045	1.131	
5 YR HI LO	4.754	1.622	1.363	1.095	1.089	1.052	1.055	1.079	1.253	1.074	1.047	1.074	1.047	1.001	1.022	1.045	1.011	1.015	1.023	1.000	NA	NA	TAIL
SELECTED	14.784	1.373	1.250	1.113	1.090	1.054	1.069	1.086	1.185	1.087	1.051	1.049	1.047	1.001	1.022	1.045	1.011	1.015	1.015	1.009	1.009	1.009	1.153

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Paid Losses

	Development in Months																						
<u>RY</u>	<u>12</u>	<u>24</u>	<u>36</u>	<u>48</u>	<u>60</u>	<u>72</u>	<u>84</u>	<u>96</u>	<u>108</u>	<u>120</u>	<u>132</u>	<u>144</u>	<u>156</u>	<u>168</u>	<u>180</u>	<u>192</u>	<u>204</u>	<u>216</u>	<u>228</u>	<u>240</u>	<u>252</u>	<u>264</u>	<u>276</u>
1994	-	-	-	43,694	43,694	43,694	43,694	43,694	53,694	66,694	66,694	76,832	93,580	111,486	111,486	132,821	138,273	138,273	155,391	178,532	178,532	194,724	220,213
1995	-	-	-	-	15,175	20,605	32,780	51,312	82,297	93,282	111,391	124,261	140,954	179,922	194,810	216,027	230,340	241,953	241,953	241,953	241,953	241,953	
1996	60,606	127,123	140,605	161,781	305,670	364,732	394,527	442,597	453,495	453,495	576,781	576,781	787,820	826,524	853,309	930,849	1,007,552	1,023,213	1,023,213	1,068,112	1,082,062		
1997	150,598	377,057	519,125	631,334	703,267	879,004	1,237,696	1,359,105	1,483,423	1,553,597	1,679,250	1,760,677	1,797,439	1,862,946	1,890,296	1,917,996	1,952,890	1,968,351	1,972,764	1,976,544			
1998	71,919	193,815	278,696	359,433	646,106	718,507	745,388	792,136	978,580	992,873	1,055,025	1,075,457	1,082,693	1,099,371	1,103,031	1,129,278	1,215,534	1,226,074	1,280,060				
1999	-	12,585	16,113	48,483	64,952	84,727	95,744	98,894	98,894	98,894	98,894	103,964	139,096	142,573	142,573	142,573	142,573	142,573					
2000	-	140,585	445,902	566,818	782,614	1,228,212	1,262,017	1,298,340	1,298,340	1,346,953	1,357,619	1,376,791	1,524,125	1,603,731	1,603,891	1,649,008	1,715,267						
2001	16,703	157,277	286,167	409,158	511,400	554,458	571,001	599,455	695,506	726,601	792,933	792,933	801,191	867,543	912,396	948,559							
2002	9,216	136,257	206,137	257,078	300,195	383,621	407,778	420,844	485,920	509,980	539,053	542,052	580,088	607,282	607,282								
2003	21,836	202,209	294,954	359,527	407,049	431,955	595,741	722,007	752,772	1,132,407	1,243,625	1,372,437	1,435,580	1,497,429									
2004	71,257	117,103	161,795	178,485	257,392	316,743	346,872	446,145	478,479	536,422	563,361	707,282	811,449										
2005	12,800	13,642	22,790	125,995	162,944	191,715	273,716	325,538	408,831	498,368	566,691	584,630											
2006	-	8,947	8,947	8,947	57,884	67,789	71,084	71,084	71,084	97,281	103,765												
2007	58,988	808,267	1,077,402	1,350,931	1,454,130	1,628,782	1,745,892	1,840,192	1,858,776	2,174,856													
2008	750,154	987,266	1,081,739	1,111,591	1,185,280	1,249,946	1,296,178	1,417,026	1,636,341														
2009	81,174	324,978	407,777	598,236	621,700	652,756	676,540	688,297															
2010	3,627	62,582	99,320	145,127	148,993	181,398	194,452																
2011	134,434	743,915	1,002,304	1,217,775	1,435,417	1,569,874																	
2012	35,519	123,028	261,546	369,814	440,068																		
2013	32,189	45,369	87,594	100,842																			
2014	37,615	719,825	882,491																				
2015	117,585	618,928																					
2016	9,664																						

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM <u>ULTIMATE</u>	PAID <u>LOSS</u>	INCURRED <u>LOSS</u>	CASE <u>RESERVE</u>	IBNR <u>RESERVE</u>	UNPAID <u>LOSS</u>
1994	250,213	220,213	250,213	30,000	-	30,000
1995	241,953	241,953	241,953	-	-	-
1996	1,366,007	1,082,062	1,366,007	283,944	-	283,944
1997	2,135,701	1,976,544	2,135,701	159,157	-	159,157
1998	1,341,060	1,280,060	1,341,060	61,000	-	61,000
1999	142,573	142,573	142,573	-	-	-
2000	2,199,740	1,715,267	2,199,740	484,473	-	484,473
2001	1,095,194	948,559	1,092,066	143,507	3,127	146,634
2002	707,027	607,282	700,590	93,307	6,437	99,745
2003	2,099,512	1,497,429	2,077,214	579,785	22,298	602,083
2004	1,216,688	811,449	1,199,204	387,756	17,484	405,240
2005	959,613	584,630	940,095	355,465	19,519	374,983
2006	218,704	103,765	213,084	109,319	5,621	114,939
2007	2,514,222	2,174,856	2,424,277	249,422	89,945	339,366
2008	2,051,974	1,636,341	1,930,604	294,262	121,370	415,632
2009	1,363,973	688,297	1,247,747	559,450	116,226	675,676
2010	357,430	194,452	316,478	122,026	40,952	162,978
2011	2,402,231	1,569,874	1,983,357	413,483	418,874	832,357
2012	1,253,878	440,068	967,172	527,104	286,706	813,810
2013	199,631	100,842	144,674	43,832	54,957	98,790
2014	2,101,603	882,491	1,374,411	491,920	727,193	1,219,112
2015	2,957,580	618,928	1,813,304	1,194,377	1,144,275	2,338,652
2016	688,270	9,664	384,295	374,631	303,976	678,607
TOTAL	29,864,776	19,527,598	26,485,817	6,958,219	3,378,959	10,337,178

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Development of Losses to Ultimate

RY	Development Period in Months																						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - ULT
1994	1.240	1.000	1.210	1.000	1.000	1.000	1.000	1.000	1.249	1.000	1.033	1.269	1.000	1.157	1.115	1.000	1.000	1.378	1.010	1.040	1.091	1.000	1.000
1995	1.000	1.000	1.813	1.217	0.548	1.278	1.777	0.919	0.822	1.000	1.000	1.143	1.107	1.000	1.000	0.923	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1996	1.474	1.153	0.784	3.459	1.255	0.930	0.978	1.000	0.819	1.012	1.000	1.041	1.000	1.017	1.385	0.988	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1997	1.209	1.079	1.378	1.058	1.153	1.092	1.196	0.957	0.995	0.995	1.000	1.031	1.000	1.000	1.000	1.006	1.000	1.000	0.991	1.000	1.000	1.000	1.000
1998	1.576	1.426	1.285	1.532	1.012	1.102	0.971	1.005	1.018	1.004	0.968	1.033	0.947	1.005	1.021	1.014	1.000	0.988	1.000	1.000	1.000	1.000	1.000
1999	0.748	1.000	1.140	1.000	0.841	0.825	0.880	1.000	1.000	1.161	1.211	1.006	0.955	1.000	1.000	0.851	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2000	1.189	1.625	1.185	0.983	0.923	1.013	0.886	1.000	1.022	1.002	0.982	1.121	0.992	1.241	0.993	1.031	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2001	0.559	0.945	1.079	0.779	1.080	0.964	1.027	1.153	1.000	0.959	1.018	1.000	1.077	1.000	1.019	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2002	1.176	1.166	0.925	1.000	0.907	0.955	1.108	1.007	0.802	1.027	1.043	1.000	0.987	1.000	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2003	0.949	0.918	1.212	0.948	1.232	1.141	1.029	1.018	1.186	1.051	1.000	1.018	1.033	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2004	0.824	0.891	0.981	1.381	1.024	1.650	1.000	1.033	1.449	1.000	0.960	1.000	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2005	0.803	1.000	0.996	1.014	0.958	2.418	1.079	1.031	1.029	1.004	0.998	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2006	0.750	1.000	1.349	1.586	1.000	0.942	1.000	1.410	1.000	1.000	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2007	2.668	1.000	0.995	0.975	1.248	1.011	1.060	1.025	1.000	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2008	0.992	0.933	1.022	1.075	1.010	0.987	1.031	1.128	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2009	0.617	0.966	1.049	1.000	0.980	1.478	0.965	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2010	0.722	1.118	0.966	1.165	1.131	0.914	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2011	1.634	1.105	1.092	0.992	0.995	1.072	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2012	1.001	1.390	1.431	1.274	1.070	1.072	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2013	0.657	0.504	1.000	1.064	1.070	1.072	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2014	1.087	1.038	1.108	1.064	1.070	1.072	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2015	1.847	1.067	1.108	1.064	1.070	1.072	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2016	1.098	1.067	1.108	1.064	1.070	1.072	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	50,001	62,000	62,000	75,000	75,000	75,000	75,000	75,000	75,000	93,694	93,694	96,832	122,832	122,832	142,070	158,405	158,405	158,405	218,273	220,532	229,333	250,213	250,213	250,213
1995	100,005	100,005	100,005	181,297	220,697	120,868	154,430	274,384	252,195	207,200	207,200	207,200	236,757	262,200	262,200	262,200	262,200	262,200	241,953	241,953	241,953	241,953	241,953	241,953
1996	216,462	319,010	367,737	288,272	997,058	1,251,389	1,163,182	1,137,140	1,137,140	931,235	942,582	942,582	980,842	980,842	997,795	1,382,410	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007
1997	766,677	926,882	999,653	1,377,240	1,457,471	1,680,019	1,833,848	2,193,541	2,099,080	2,087,828	2,077,038	2,077,038	2,141,861	2,142,127	2,142,127	2,142,127	2,155,701	2,155,701	2,155,701	2,135,701	2,135,701	2,135,701	2,135,701	2,135,701
1998	280,352	441,921	629,991	809,760	1,240,170	1,255,103	1,382,637	1,342,716	1,349,223	1,373,262	1,378,815	1,334,952	1,378,952	1,305,491	1,311,491	1,339,090	1,358,000	1,358,000	1,341,060	1,341,060	1,341,060	1,341,060	1,341,060	1,341,060
1999	238,001	177,974	177,974	202,865	202,865	170,514	140,744	123,894	123,894	123,894	143,894	174,287	175,410	167,573	167,573	167,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573	142,573
2000	830,009	986,785	1,603,954	1,900,891	1,868,003	1,724,741	1,747,051	1,548,700	1,548,700	1,582,140	1,585,805	1,557,714	1,746,592	1,731,797	2,148,891	2,133,481	2,199,740	2,199,740	2,199,740	2,199,740	2,199,740	2,199,740	2,199,740	2,199,740
2001	1,863,012	1,040,851	983,642	1,061,656	827,034	892,953	860,467	883,417	1,018,928	1,018,928	977,435	995,386	995,386	1,071,788	1,071,788	1,092,066	1,095,194	1,095,194	1,095,194	1,095,194	1,095,194	1,095,194	1,095,194	1,095,194
2002	675,164	793,896	925,518	855,817	855,481	775,594	741,003	821,003	826,548	662,748	680,698	709,949	709,949	700,590	700,590	705,008	707,027	707,027	707,027	707,027	707,027	707,027	707,027	707,027
2003	1,076,012	1,021,470	937,537	1,136,270	1,077,375	1,327,039	1,513,804	1,556,990	1,584,735	1,879,459	1,974,626	1,974,626	2,010,726	2,077,214	2,080,396	2,093,517	2,099,512	2,099,512	2,099,512	2,099,512	2,099,512	2,099,512	2,099,512	2,099,512
2004	496,850	409,451	364,653	357,620	494,041	505,771	834,631	834,631	861,768	1,248,642	1,248,642	1,199,204	1,199,204	1,203,766	1,205,610	1,213,214	1,216,688	1,216,688	1,216,688	1,216,688	1,216,688	1,216,688	1,216,688	1,216,688
2005	436,007	350,003	350,003	348,601	353,601	338,873	819,445	884,264	911,289	937,852	941,848	940,095	945,823	949,421	950,876	956,873	959,613	959,613	959,613	959,613	959,613	959,613	959,613	959,613
2006	100,001	75,001	75,001	101,150	160,447	160,447	151,084	151,084	213,084	213,084	213,084	214,256	215,561	216,381	216,713	218,080	218,704	218,704	218,704	218,704	218,704	218,704	218,704	218,704
2007	682,440	1,820,729	1,821,179	1,812,130	1,767,555	2,205,757	2,230,289	2,364,750	2,424,277	2,424,277	2,449,607	2,463,082	2,478,092	2,487,519	2,491,330	2,507,042	2,514,222	2,514,222	2,514,222	2,514,222	2,514,222	2,514,222	2,514,222	2,514,222
2008	1,638,551	1,624,832	1,516,553	1,550,168	1,666,353	1,682,424	1,660,446	1,711,851	1,930,604	1,978,566	1,999,239	2,010,236	2,022,487	2,030,180	2,033,290	2,046,114	2,051,974	2,051,974	2,051,974	2,051,974	2,051,974	2,051,974	2,051,974	2,051,974
2009	1,426,176	879,758	849,967	891,837	891,837	874,344	1,292,547	1,247,747	1,283,297	1,315,178	1,328,920	1,336,230	1,344,373	1,349,487	1,351,554	1,360,078	1,363,973	1,363,973	1,363,973	1,363,973	1,363,973	1,363,973	1,363,973	1,363,973
2010	337,003	243,262	272,086	262,819	306,255	346,255	316,478	326,973	336,288	344,643	348,244	350,160	352,293	353,634	354,175	356,409	357,430	357,430	357,430	357,430	357,430	357,430	357,430	357,430
2011	1,018,742	1,664,572	1,839,853	2,009,107	1,993,817	1,983,357	2,126,999	2,197,534	2,260,144	2,316,292	2,340,494	2,353,369	2,367,711	2,376,717	2,380,359	2,395,371	2,402,231	2,402,231	2,402,231	2,402,231	2,402,231	2,402,231	2,402,231	2,402,231
2012	381,536	381,909	530,689	759,272	967,172	1,035,241	1,110,217	1,147,034</																

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Selection of Loss Development Factors

RY	Development Period in Months																						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	
1994	1.240	1.000	1.210	1.000	1.000	1.000	1.000	1.000	1.249	1.000	1.033	1.269	1.000	1.157	1.115	1.000	1.000	1.378	1.010	1.040	1.091	1.000	
1995	1.000	1.000	1.813	1.217	0.548	1.278	1.777	0.919	0.822	1.000	1.000	1.143	1.107	1.000	1.000	1.000	0.923	1.000	1.000	1.000	1.000	1.000	
1996	1.474	1.153	0.784	3.459	1.255	0.930	0.978	1.000	0.819	1.012	1.000	1.041	1.000	1.017	1.385	0.988	1.000	1.000	1.000	1.000	1.000	1.000	
1997	1.209	1.079	1.378	1.058	1.153	1.092	1.196	0.957	0.995	0.995	1.000	1.031	1.000	1.000	1.000	1.006	1.000	1.000	1.000	0.991			
1998	1.576	1.426	1.285	1.532	1.012	1.102	0.971	1.005	1.018	1.004	0.968	1.033	0.947	1.005	1.021	1.014	1.000	0.988					
1999	0.748	1.000	1.140	1.000	0.841	0.825	0.880	1.000	1.000	1.161	1.211	1.006	0.955	1.000	1.000	0.851	1.000						
2000	1.189	1.625	1.185	0.983	0.923	1.013	0.886	1.000	1.022	1.002	0.982	1.121	0.992	1.241	0.993	1.031							
2001	0.559	0.945	1.079	0.779	1.080	0.964	1.027	1.153	1.000	0.959	1.018	1.000	1.077	1.000	1.019								
2002	1.176	1.166	0.925	1.000	0.907	0.955	1.108	1.007	0.802	1.027	1.043	1.000	0.987	1.000									
2003	0.949	0.918	1.212	0.948	1.232	1.141	1.029	1.018	1.186	1.051	1.000	1.018	1.033										
2004	0.824	0.891	0.981	1.381	1.024	1.650	1.000	1.033	1.449	1.000	0.960	1.000											
2005	0.803	1.000	0.996	1.014	0.958	2.418	1.079	1.031	1.029	1.004	0.998												
2006	0.750	1.000	1.349	1.586	1.000	0.942	1.000	1.410	1.000	1.000													
2007	2.668	1.000	0.995	0.975	1.248	1.011	1.060	1.025	1.000														
2008	0.992	0.933	1.022	1.075	1.010	0.987	1.031	1.128															
2009	0.617	0.966	1.049	1.000	0.980	1.478	0.965																
2010	0.722	1.118	0.966	1.165	1.131	0.914																	
2011	1.634	1.105	1.092	0.992	0.995																		
2012	1.001	1.390	1.431	1.274																			
2013	0.657	0.504	1.000																				
2014	1.087	1.038																					
2015	1.847																						
VOL WTD 3	1.299	1.028	1.158	1.078	1.004	1.126	1.027	1.080	1.007	1.002	0.988	1.009	1.036	1.119	1.001	1.017	1.000	0.997	0.995	1.005	1.044	1.000	
VOL WTD 5	1.355	1.067	1.118	1.064	1.070	1.072	1.033	1.066	1.118	1.024	0.999	1.035	1.020	1.085	1.005	1.008	0.996	1.008	0.996	1.005	1.044	1.000	
VOL WTD ALL	1.098	1.067	1.108	1.090	1.056	1.099	1.033	1.028	1.025	1.009	0.997	1.038	1.006	1.054	1.053	1.008	0.996	1.008	0.996	1.005	1.044	1.000	
ARITH 3	1.197	0.977	1.174	1.144	1.035	1.126	1.019	1.188	1.010	1.001	0.986	1.006	1.032	1.080	1.004	0.965	1.000	0.996	0.997	1.013	1.046	1.000	
ARITH 5	1.245	1.031	1.108	1.101	1.073	1.066	1.027	1.125	1.133	1.016	1.004	1.028	1.009	1.049	1.007	0.978	0.985	1.073	1.000	1.013	1.046	1.000	
ARITH ALL	1.124	1.060	1.145	1.234	1.016	1.159	1.062	1.046	1.028	1.017	1.018	1.060	1.010	1.047	1.067	0.984	0.987	1.073	1.000	1.013	1.046	1.000	
5 YR HI LO	1.241	1.087	1.047	1.080	1.045	0.980	1.030	1.064	1.072	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	NA	NA	TAIL
SELECTED	1.098	1.067	1.108	1.064	1.070	1.072	1.033	1.028	1.025	1.010	1.006	1.006	1.004	1.002	1.006	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Incurred Losses

	Development in Months																						
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276
1994	50,001	62,000	62,000	75,000	75,000	75,000	75,000	75,000	75,000	93,694	93,694	96,832	122,832	122,832	142,070	158,405	158,405	158,405	218,273	220,532	229,333	250,213	250,213
1995	100,005	100,005	100,005	181,297	220,697	120,868	154,430	274,384	252,195	207,200	207,200	207,200	236,757	262,200	262,200	262,200	241,953	241,953	241,953	241,953	241,953	241,953	241,953
1996	216,462	319,010	367,737	288,272	997,058	1,251,389	1,163,182	1,137,140	1,137,140	931,235	942,582	942,582	980,842	980,842	997,795	1,382,410	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007	1,366,007
1997	766,677	926,882	999,653	1,377,240	1,457,471	1,680,019	1,833,848	2,193,541	2,099,080	2,087,828	2,077,038	2,077,038	2,141,861	2,142,127	2,142,127	2,142,127	2,155,701	2,155,701	2,155,701	2,155,701	2,155,701	2,155,701	2,155,701
1998	280,352	441,921	629,991	809,760	1,240,170	1,255,103	1,382,637	1,342,716	1,349,223	1,373,262	1,378,815	1,334,952	1,378,952	1,305,491	1,311,491	1,339,090	1,358,000	1,358,000	1,358,000	1,341,060	1,341,060	1,341,060	1,341,060
1999	238,001	177,974	177,974	202,865	202,865	170,514	140,744	123,894	123,894	123,894	143,894	174,287	175,410	167,573	167,573	167,573	167,573	142,573	142,573	142,573	142,573	142,573	142,573
2000	830,009	986,785	1,603,954	1,900,891	1,868,003	1,724,741	1,747,051	1,548,700	1,548,700	1,582,140	1,585,805	1,557,714	1,746,592	1,731,797	2,148,891	2,133,481	2,199,740	2,199,740	2,199,740	2,199,740	2,199,740	2,199,740	2,199,740
2001	1,863,012	1,040,851	983,642	1,061,656	827,034	892,953	860,467	883,417	1,018,928	1,018,928	977,435	995,386	995,386	1,071,788	1,071,788	1,071,788	1,071,788	1,071,788	1,071,788	1,071,788	1,071,788	1,071,788	1,071,788
2002	675,164	793,896	925,518	855,817	855,481	775,594	741,003	821,003	826,548	662,748	680,698	709,949	709,949	700,590	700,590	700,590	700,590	700,590	700,590	700,590	700,590	700,590	700,590
2003	1,076,012	1,021,470	937,537	1,136,270	1,077,375	1,327,039	1,513,804	1,556,990	1,584,735	1,879,459	1,974,626	1,974,626	2,010,726	2,077,214	2,077,214	2,077,214	2,077,214	2,077,214	2,077,214	2,077,214	2,077,214	2,077,214	2,077,214
2004	496,850	409,451	364,653	357,620	494,041	505,771	834,631	834,631	861,768	1,248,642	1,248,642	1,248,642	1,248,642	1,199,204	1,199,204	1,199,204	1,199,204	1,199,204	1,199,204	1,199,204	1,199,204	1,199,204	1,199,204
2005	436,007	350,003	350,003	348,601	353,601	338,873	819,445	884,264	911,289	937,852	941,848	940,095	940,095	940,095	940,095	940,095	940,095	940,095	940,095	940,095	940,095	940,095	940,095
2006	100,001	75,001	75,001	101,150	160,447	160,447	151,084	151,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084	213,084
2007	682,440	1,820,729	1,821,179	1,812,130	1,767,555	2,205,757	2,230,289	2,364,750	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277	2,424,277
2008	1,638,551	1,624,832	1,516,553	1,550,168	1,666,353	1,682,424	1,660,446	1,711,851	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604	1,930,604
2009	1,426,176	879,758	849,967	891,837	891,837	874,344	1,292,547	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747	1,247,747
2010	337,003	243,262	272,086	262,819	306,255	346,255	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478	316,478
2011	1,018,742	1,664,572	1,839,853	2,009,107	1,993,817	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357	1,983,357
2012	381,536	381,909	530,689	759,272	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172	967,172
2013	437,003	287,001	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674	144,674
2014	1,217,768	1,324,230	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411	1,374,411
2015	981,609	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304	1,813,304
2016	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295	384,295

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Determination of Pure Premium

(1) <u>RY</u>	(2) PAID LDM <u>ULTIMATE</u>	(3) INC LDM <u>ULTIMATE</u>	(4) SELECTED <u>ULTIMATE</u>	(5) POLICIES <u>IN FORCE</u>	(6) PURE <u>PREMIUM</u>
2008	3,215,928	2,051,974	2,633,951	2,664	989
2009	1,469,362	1,363,973	1,416,668	2,662	532
2010	443,585	357,430	400,507	2,622	153
2011	3,773,955	2,402,231	3,088,093	2,623	1,177
2012	1,153,378	1,253,878	1,203,628	2,617	460
2013	294,155	199,631	246,893	2,603	95
2014	3,218,876	2,101,603	2,660,240	2,573	1,034
2015	3,100,440	2,957,580	3,029,010	2,530	1,197
2016	715,694	688,270	701,982	2,509	280
TOTAL	35,536,804	29,864,776	32,700,790	23,403	1,397

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2007	2,664	989	830	766	2,041,618	39.7%	810,986	1,636,341	2,447,327	1,930,604	516,724	294,262	919
2008	2,662	532	457	750	1,995,983	49.1%	980,379	688,297	1,668,676	1,247,747	420,929	559,450	627
2009	2,622	153	134	734	1,923,491	53.2%	1,022,465	194,452	1,216,916	316,478	900,439	122,026	464
2010	2,623	1,177	1,055	718	1,882,627	56.2%	1,057,352	1,569,874	2,627,226	1,983,357	643,869	413,483	1,002
2011	2,617	460	421	702	1,837,716	58.4%	1,073,271	440,068	1,513,339	967,172	546,166	527,104	578
2012	2,603	95	89	687	1,788,371	61.8%	1,106,023	100,842	1,206,865	144,674	1,062,191	43,832	464
2013	2,573	1,034	990	672	1,729,545	65.7%	1,136,626	882,491	2,019,117	1,374,411	644,706	491,920	785
2014	2,530	1,197	1,171	658	1,663,877	72.6%	1,207,706	618,928	1,826,634	1,813,304	13,330	1,194,377	722
2015	2,509	280	280	643	1,614,395	80.0%	1,292,120	9,664	1,301,784	384,295	917,489	374,631	519
TOTAL	23,403				16,477,623		9,686,929	6,140,956	15,827,885	10,162,042	5,665,843	4,021,086	676
<u>Pure Premium Selection</u>					Trend =		0.978						
3-Year Average x Latest			750										
5-Year Average x Latest			745										
All Year Average x Latest			643										
Selected Pure Premium			643										

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Release  
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT IBNR	EXPECTED IBNR	INCURRED LOSSES	INDICATED ULTIMATE	PAID LOSSES	UNPAID LOSS	CASE RESERVE	ULTIMATE PURE PREM
2008	2,664	989	830	766	2,041,618	5.9%	120,758	1,930,604	2,051,361	1,636,341	415,020	294,262	770
2009	2,662	532	457	750	1,995,983	8.5%	170,080	1,247,747	1,417,827	688,297	729,530	559,450	533
2010	2,622	153	134	734	1,923,491	11.5%	220,381	316,478	536,859	194,452	342,407	122,026	205
2011	2,623	1,177	1,055	718	1,882,627	17.4%	328,271	1,983,357	2,311,628	1,569,874	741,754	413,483	881
2012	2,617	460	421	702	1,837,716	22.9%	420,203	967,172	1,387,376	440,068	947,308	527,104	530
2013	2,603	95	89	687	1,788,371	27.5%	492,328	144,674	637,002	100,842	536,160	43,832	245
2014	2,573	1,034	990	672	1,729,545	34.6%	598,454	1,374,411	1,972,864	882,491	1,090,373	491,920	767
2015	2,530	1,197	1,171	658	1,663,877	38.7%	643,747	1,813,304	2,457,051	618,928	1,838,124	1,194,377	971
2016	2,509	280	280	643	1,614,395	44.2%	713,000	384,295	1,097,295	9,664	1,087,631	374,631	437
TOTAL	23,403				16,477,623		3,707,222	10,162,042	13,869,263	6,140,956	7,728,307	4,021,086	593
	<u>Pure Premium Selection</u>				Trend =	0.978							
	3-Year Average x Latest		500										
	5-Year Average x Latest		538										
	All Year Average x Latest		568										
	Selected Pure Premium		568										

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	PAID LDM <u>ULTIMATE</u>	SELECTED <u>ULTIMATE</u>	PAID <u>LOSS</u>	INCURRED <u>LOSS</u>	CASE <u>RESERVE</u>	IBNR <u>RESERVE</u>
1994	772,355	875,960	724,556	875,960	151,404	-
1995	887,760	830,629	830,629	830,629	-	-
1996	4,082,382	4,082,382	3,785,792	3,887,596	101,804	194,786
1997	4,699,432	4,699,432	4,309,814	4,693,260	383,446	6,172
1998	5,277,926	5,277,926	4,773,615	5,265,050	491,435	12,876
1999	10,180,460	10,180,460	9,049,576	9,873,136	823,560	307,324
2000	5,888,205	5,888,205	5,122,239	5,574,262	452,023	313,944
2001	2,359,733	2,359,733	2,018,978	2,231,893	212,915	127,841
2002	4,854,884	4,854,884	4,079,843	4,369,340	289,497	485,544
2003	3,503,268	3,503,268	2,887,346	3,081,544	194,198	421,725
2004	2,524,911	2,524,911	2,050,897	2,310,706	259,809	214,205
2005	2,532,523	2,532,523	2,004,142	2,411,172	407,030	121,351
2006	1,606,518	1,606,518	1,239,850	1,418,755	178,905	187,763
2007	4,290,568	4,290,568	3,195,238	3,692,463	497,225	598,106
2008	3,088,004	3,088,004	2,203,792	2,784,301	580,509	303,703
2009	2,603,096	2,603,096	1,771,068	1,869,496	98,428	733,600
2010	1,965,019	1,965,019	1,293,850	1,843,937	550,087	121,082
2011	1,934,360	1,934,360	1,208,286	1,567,380	359,094	366,980
2012	2,869,239	2,869,239	1,672,985	2,811,353	1,138,368	57,886
2013	3,436,757	3,436,757	1,711,865	2,945,843	1,233,978	490,914
2014	3,211,455	3,211,455	1,354,211	2,498,436	1,144,226	713,019
2015	1,933,120	1,933,120	591,352	1,097,254	505,901	835,867
2016	1,544,012	1,544,012	148,859	494,420	345,561	1,049,592
TOTAL	76,045,988	76,092,462	58,028,782	68,428,185	10,399,403	7,664,278

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Development of Losses to Ultimate

RY	Development Period in Months																ULT						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - ULT
1994	1.590	1.284	2.725	1.390	1.000	1.129	1.360	1.656	1.129	1.207	1.047	1.079	1.019	1.004	1.102	1.083	1.001	1.059	1.031	1.000	1.046	1.003	1.066
1995	1.931	1.289	1.132	1.533	1.023	1.266	1.393	1.005	1.040	1.013	1.043	1.008	1.000	1.010	1.000	1.028	1.000	1.036	1.000	1.036	1.000	1.003	1.066
1996	1.951	1.854	1.381	1.832	1.102	1.078	1.026	1.059	1.034	1.022	1.015	1.052	1.015	1.018	1.018	1.008	1.011	1.004	1.023	1.022	1.009	1.003	1.066
1997	5.932	1.929	1.608	1.303	1.185	1.275	1.075	1.043	1.055	1.059	1.023	1.040	1.051	1.045	1.019	1.014	1.016	1.050	1.021	1.011	1.009	1.003	1.066
1998	5.396	1.373	1.182	1.137	1.047	1.093	1.057	1.077	1.068	1.091	1.022	1.062	1.028	1.009	1.026	1.015	1.047	1.054	1.014	1.011	1.009	1.003	1.066
1999	3.145	1.413	1.151	1.230	1.119	1.083	1.082	1.054	1.045	1.051	1.035	1.034	1.044	1.017	1.015	1.021	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2000	2.794	1.171	1.209	1.059	1.096	1.051	1.035	1.083	1.030	1.048	1.022	1.069	1.019	1.023	1.018	1.027	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2001	1.379	1.610	1.131	1.121	1.052	1.061	1.021	1.044	1.031	1.037	1.057	1.024	1.013	1.024	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2002	2.952	1.311	1.160	1.055	1.048	1.343	1.023	1.026	1.012	1.018	1.028	1.020	1.012	1.019	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2003	2.242	1.245	1.134	1.118	1.091	1.096	1.060	1.025	1.029	1.042	1.015	1.027	1.006	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2004	6.475	1.290	1.079	1.064	1.094	1.117	1.039	1.023	1.013	1.082	1.016	1.028	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2005	2.800	1.295	1.163	1.080	1.079	1.006	1.039	1.058	1.049	1.027	1.016	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2006	3.574	1.540	1.136	1.366	1.032	1.073	1.086	1.027	1.001	1.027	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2007	4.897	1.574	1.091	1.110	1.096	1.059	1.011	1.071	1.089	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2008	3.181	1.294	1.214	1.216	1.094	1.068	1.037	1.047	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2009	4.550	1.176	1.057	1.032	1.024	1.028	1.025	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2010	9.898	1.200	1.190	1.142	1.092	1.042	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2011	2.092	1.360	1.105	1.049	1.034	1.054	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2012	2.259	1.678	1.189	1.204	1.071	1.054	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2013	2.154	1.421	1.329	1.171	1.071	1.054	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2014	7.132	1.486	1.181	1.171	1.071	1.054	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2015	10.893	1.378	1.181	1.171	1.071	1.054	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066
2016	3.173	1.378	1.181	1.171	1.071	1.054	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	17,096	27,184	34,895	95,084	132,148	132,148	149,193	202,874	336,027	379,362	457,817	479,155	517,191	527,042	529,376	583,342	631,688	632,598	669,990	690,824	690,824	722,650	724,556	772,355
1995	89,034	171,911	221,544	250,710	384,248	393,149	497,892	693,726	697,392	725,043	734,723	766,019	772,311	772,311	779,668	779,668	779,668	801,569	801,569	801,569	830,629	830,629	832,820	887,760
1996	248,435	484,694	898,742	1,241,483	2,274,586	2,506,109	2,700,383	2,769,493	2,933,288	3,033,001	3,134,874	3,203,100	3,252,258	3,422,969	3,474,090	3,537,955	3,565,408	3,605,861	3,620,092	3,703,617	3,785,792	3,819,662	3,829,738	4,082,382
1997	72,267	428,681	827,136	1,330,215	1,733,340	2,054,451	2,619,485	2,814,896	2,935,198	3,095,331	3,278,812	3,354,318	3,489,099	3,666,009	3,832,033	3,903,871	3,957,587	4,020,225	4,222,873	4,309,814	4,358,012	4,397,002	4,408,600	4,699,432
1998	244,191	1,317,603	1,808,685	2,137,859	2,431,813	2,545,169	2,781,548	2,941,195	3,167,671	3,383,414	3,689,967	3,771,262	4,003,931	4,114,580	4,152,017	4,258,947	4,324,127	4,527,913	4,773,615	4,840,347	4,894,478	4,938,267	4,951,293	5,277,926
1999	786,801	2,474,382	3,496,322	4,023,648	4,948,985	5,540,026	6,001,712	6,496,501	6,850,066	7,158,107	7,522,683	7,784,778	8,050,943	8,403,872	8,550,000	8,674,731	8,858,161	9,049,576	9,207,708	9,336,424	9,440,836	9,525,300	9,550,427	10,180,460
2000	738,273	2,062,618	2,415,497	2,919,665	3,092,893	3,389,522	3,561,543	3,685,610	3,990,320	4,108,957	4,305,211	4,399,521	4,703,612	4,793,636	4,902,861	4,988,988	5,122,239	5,234,121	5,325,582	5,400,029	5,460,420	5,509,272	5,523,805	5,888,205
2001	493,157	680,163	1,095,144	1,238,075	1,388,175	1,460,247	1,549,347	1,581,683	1,652,001	1,702,772	1,766,170	1,865,996	1,911,094	1,936,133	1,983,119	2,018,978	2,052,768	2,097,605	2,134,259	2,164,094	2,188,296	2,207,874	2,213,698	2,359,733
2002	523,306	1,545,046	2,024,839	2,349,790	2,479,316	2,598,612	3,489,397	3,570,739	3,663,170	3,707,244	3,775,271	3,880,256	3,958,320	4,004,981	4,079,843	4,153,817	4,223,337	4,315,585	4,390,996	4,452,378	4,502,171	4,542,450	4,554,432	4,854,884
2003	558,641	1,252,492	1,559,919	1,768,858	1,977,267	2,157,660	2,363,773	2,505,098	2,568,104	2,643,427	2,753,678	2,796,043	2,871,359	2,887,346	2,944,001	2,997,381	3,047,546	3,114,112	3,168,528	3,212,821	3,248,752	3,277,817	3,286,463	3,503,268
2004	143,829	931,294	1,201,475	1,296,399	1,379,054	1,509,347	1,686,522	1,752,111	1,791,788	1,815,522	1,934,768	2,050,897	2,080,997	2,121,830	2,160,303	2,196,458	2,244,434	2,283,653	2,315,577	2,341,473	2,362,421	2,368,653	2,524,911	
2005	337,211	944,193	1,222,262	1,421,775	1,535,499	1,656,178	1,665,460	1,730,844	1,831,040	1,920,466	1,971,656	2,004,142	2,057,080	2,087,271	2,128,227	2,166,816	2,203,080	2,251,201	2,290,538	2,328,532	2,369,544	2,375,794	2,532,523	
2006	114,292	408,515	629,120	714,825	976,707	1,008,090	1,081,296	1,174,274	1,206,522	1,207,387	1,239,850	1,271,337	1,304,919	1,324,070	1,350,051	1,374,530	1,397,535	1,428,060	1,453,014	1,473,326	1,489,803	1,503,131	1,507,096	1,606,518
2007	249,922	1,223,865	1,926,859	2,102,500	2,334,792	2,559,689	2,711,518	2,740,693	2,935,041	3,195,238	3,311,297	3,395,392	3,485,079	3,536,227	3,605,615	3,670,991	3,732,430	3,813,956	3,880,601	3,934,848	3,978,853	4,014,451	4,025,040	4,290,568
2008	285,783	909,119	1,176,822	1,428,082	1,736,851	1,899,675	2,029,161	2,105,246	2,203,792	2,299,674	2,383,204	2,443,728	2,508,278	2,545,090	2,595,030	2,642,082	2,686,301	2,744,977	2,792,942	2,831,985	2,863,656	2,889,277	2,896,898	3,088,004
2009	281,383	1,280,215	1,505,006	1,590,623	1,641,266	1,680,809	1,727,791	1,771,068	1,857,731	1,938,557	2,008,970	2,059,990	2,114,404	2,145,436	2,187,533	2,227,197	2,264,472	2,313,934	2,354,368	2,387,280	2,413,977	2,435,574	2,441,999	2,603,096
2010	70,430	697,094	836,490	995,262	1,136,718	1,241,412	1,293,850	1,336,940	1,380,360	1,463,374	1,516,527	1,555,041	1,596,117	1,619,542	1,651,321	1,681,262	1,709,400	1,746,738	1,777,260	1,802,105	1,822,258	1,838,561	1,843,411	1,965,019
2011	354,238	741,233	1,008,015	1,114,183	1,168,623	1,208,286	1,273,663	1,316,080	1,440,541	1,492,866	1,530,779	1,571,213	1,594,773	1,625,556	1,655,030	1								

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Selection of Loss Development Factors

RY	Development Period in Months																204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204							
1994	1.590	1.284	2.725	1.390	1.000	1.129	1.360	1.656	1.129	1.207	1.047	1.079	1.019	1.004	1.102	1.083	1.001	1.059	1.031	1.000	1.046	1.003	
1995	1.931	1.289	1.132	1.533	1.023	1.266	1.393	1.005	1.040	1.013	1.043	1.008	1.000	1.010	1.000	1.000	1.028	1.000	1.000	1.036	1.000		
1996	1.951	1.854	1.381	1.832	1.102	1.078	1.026	1.059	1.034	1.034	1.022	1.015	1.052	1.015	1.018	1.008	1.011	1.004	1.023	1.022			
1997	5.932	1.929	1.608	1.303	1.185	1.275	1.075	1.043	1.055	1.059	1.023	1.040	1.051	1.045	1.019	1.014	1.016	1.050	1.021				
1998	5.396	1.373	1.182	1.137	1.047	1.093	1.057	1.077	1.068	1.091	1.022	1.062	1.028	1.009	1.026	1.015	1.047	1.054					
1999	3.145	1.413	1.151	1.230	1.119	1.083	1.082	1.054	1.045	1.051	1.035	1.034	1.044	1.017	1.015	1.021	1.022						
2000	2.794	1.171	1.209	1.059	1.096	1.051	1.035	1.083	1.030	1.048	1.022	1.069	1.019	1.023	1.018	1.027							
2001	1.379	1.610	1.131	1.121	1.052	1.061	1.021	1.044	1.031	1.037	1.057	1.024	1.013	1.024	1.018								
2002	2.952	1.311	1.160	1.055	1.048	1.343	1.023	1.026	1.012	1.018	1.028	1.020	1.012	1.019									
2003	2.242	1.245	1.134	1.118	1.091	1.096	1.060	1.025	1.029	1.042	1.015	1.027	1.006										
2004	6.475	1.290	1.079	1.064	1.094	1.117	1.039	1.023	1.013	1.082	1.016	1.028											
2005	2.800	1.295	1.163	1.080	1.079	1.006	1.039	1.058	1.049	1.027	1.016												
2006	3.574	1.540	1.136	1.366	1.032	1.073	1.086	1.027	1.001	1.027													
2007	4.897	1.574	1.091	1.110	1.096	1.059	1.011	1.071	1.089														
2008	3.181	1.294	1.214	1.216	1.094	1.068	1.037	1.047															
2009	4.550	1.176	1.057	1.032	1.024	1.028	1.025																
2010	9.898	1.200	1.190	1.142	1.092	1.042																	
2011	2.092	1.360	1.105	1.049	1.034																		
2012	2.259	1.678	1.189	1.204																			
2013	2.154	1.421	1.329																				
2014	7.132	1.486																					
2015	10.893																						
VOL WTD 3	3.996	1.516	1.217	1.137	1.047	1.047	1.023	1.054	1.059	1.047	1.016	1.024	1.010	1.022	1.016	1.021	1.027	1.038	1.020	1.021	1.021	1.003	
VOL WTD 5	3.040	1.431	1.171	1.129	1.071	1.054	1.033	1.049	1.044	1.036	1.025	1.037	1.025	1.018	1.018	1.018	1.024	1.037	1.021	1.021	1.021	1.003	
VOL WTD 4	3.173	1.378	1.181	1.171	1.085	1.104	1.052	1.054	1.042	1.049	1.027	1.037	1.030	1.020	1.019	1.019	1.024	1.037	1.021	1.021	1.021	1.003	
ARITH 3	6.726	1.528	1.208	1.132	1.050	1.046	1.024	1.048	1.046	1.045	1.016	1.025	1.010	1.022	1.017	1.021	1.028	1.036	1.015	1.019	1.023	1.003	
ARITH 5	4.906	1.429	1.174	1.129	1.068	1.054	1.040	1.045	1.036	1.039	1.026	1.034	1.019	1.018	1.019	1.017	1.025	1.034	1.019	1.019	1.023	1.003	
ARITH ALL	4.055	1.419	1.268	1.213	1.073	1.110	1.086	1.087	1.045	1.057	1.029	1.037	1.024	1.018	1.027	1.024	1.021	1.034	1.019	1.019	1.023	1.003	
5 YR HI LO	3.848	1.422	1.161	1.132	1.073	1.057	1.034	1.044	1.030	1.032	1.020	1.026	1.015	1.020	1.018	1.017	1.022	1.036	1.022	1.022	NA	NA	TAIL
SELECTED	3.173	1.378	1.181	1.171	1.071	1.054	1.033	1.049	1.044	1.036	1.025	1.026	1.015	1.020	1.018	1.017	1.022	1.017	1.014	1.011	1.009	1.003	1.066

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Paid Losses

RY	Development in Months																			
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
1994	17,096	27,184	34,895	95,084	132,148	132,148	149,193	202,874	336,027	379,362	457,817	479,155	517,191	527,042	529,376	583,342	631,688	632,598	669,990	690,824
1995	89,034	171,911	221,544	250,710	384,248	393,149	497,892	693,726	697,392	725,043	734,723	766,019	772,311	772,311	779,668	779,668	779,668	801,569	801,569	801,569
1996	248,435	484,694	898,742	1,241,483	2,274,586	2,506,109	2,700,383	2,769,493	2,933,288	3,033,001	3,134,874	3,203,100	3,252,258	3,422,969	3,474,090	3,537,955	3,565,408	3,605,861	3,620,092	3,703,617
1997	72,267	428,681	827,136	1,330,215	1,733,340	2,054,451	2,619,485	2,814,896	2,935,198	3,095,331	3,278,812	3,354,318	3,489,099	3,666,009	3,832,033	3,903,871	3,957,587	4,020,225	4,222,873	4,309,814
1998	244,191	1,317,603	1,808,685	2,137,859	2,431,813	2,545,169	2,781,548	2,941,195	3,167,671	3,383,414	3,689,967	3,771,262	4,003,931	4,114,580	4,152,017	4,258,947	4,324,127	4,527,913	4,773,615	
1999	786,810	2,474,382	3,496,322	4,023,648	4,948,985	5,540,026	6,001,712	6,496,501	6,850,066	7,158,107	7,522,683	7,784,778	8,050,943	8,403,872	8,550,000	8,674,731	8,858,161	9,049,576		
2000	738,273	2,062,618	2,415,497	2,919,665	3,092,893	3,389,522	3,561,543	3,685,610	3,990,320	4,108,957	4,305,211	4,399,521	4,703,612	4,793,636	4,902,861	4,988,988	5,122,239			
2001	493,157	680,163	1,095,144	1,238,075	1,388,175	1,460,247	1,549,347	1,581,683	1,652,001	1,702,772	1,766,170	1,865,996	1,911,094	1,936,133	1,983,119	2,018,978				
2002	523,306	1,545,046	2,024,839	2,349,790	2,479,316	2,598,612	3,489,397	3,570,739	3,663,170	3,707,244	3,775,271	3,880,256	3,958,320	4,004,981	4,079,843					
2003	558,641	1,252,492	1,559,919	1,768,858	1,977,267	2,157,660	2,363,773	2,505,098	2,568,104	2,643,427	2,753,678	2,796,043	2,871,359	2,887,346						
2004	143,829	931,294	1,201,475	1,296,399	1,379,054	1,509,347	1,686,522	1,752,111	1,791,788	1,815,522	1,963,819	1,971,656	2,050,897							
2005	337,211	944,193	1,222,262	1,421,775	1,535,499	1,656,178	1,665,460	1,730,844	1,831,040	1,920,466	1,971,656	2,004,142								
2006	114,292	408,515	629,120	714,825	976,707	1,008,090	1,081,296	1,174,274	1,206,522	1,207,387	1,239,850									
2007	249,922	1,223,865	1,926,859	2,102,500	2,334,792	2,559,689	2,711,518	2,740,693	2,935,041	3,195,238										
2008	285,783	909,119	1,176,822	1,428,082	1,736,851	1,899,675	2,029,161	2,105,246	2,203,792											
2009	281,383	1,280,215	1,505,006	1,590,623	1,641,266	1,680,809	1,727,791	1,771,068												
2010	70,430	697,094	836,490	995,262	1,136,718	1,241,412	1,293,850													
2011	354,238	741,233	1,008,015	1,114,183	1,168,623	1,208,286														
2012	308,280	696,402	1,168,776	1,389,447	1,672,985															
2013	420,803	906,448	1,288,052	1,711,865																
2014	127,794	911,475	1,354,211																	
2015	54,289	591,352																		
2016	148,859																			



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	875,960	724,556	875,960	151,404	-	151,404
1995	830,629	830,629	830,629	-	-	-
1996	3,887,596	3,785,792	3,887,596	101,804	-	101,804
1997	4,693,260	4,309,814	4,693,260	383,446	-	383,446
1998	5,297,002	4,773,615	5,265,050	491,435	31,952	523,387
1999	10,053,616	9,049,576	9,873,136	823,560	180,480	1,004,040
2000	5,728,207	5,122,239	5,574,262	452,023	153,945	605,967
2001	2,302,577	2,018,978	2,231,893	212,915	70,684	283,599
2002	4,577,689	4,079,843	4,369,340	289,497	208,350	497,847
2003	3,245,820	2,887,346	3,081,544	194,198	164,276	358,474
2004	2,454,184	2,050,897	2,310,706	259,809	143,478	403,287
2005	2,594,441	2,004,142	2,411,172	407,030	183,269	590,299
2006	1,548,385	1,239,850	1,418,755	178,905	129,630	308,535
2007	4,094,514	3,195,238	3,692,463	497,225	402,051	899,276
2008	3,144,369	2,203,792	2,784,301	580,509	360,068	940,577
2009	2,148,971	1,771,068	1,869,496	98,428	279,476	377,903
2010	2,128,814	1,293,850	1,843,937	550,087	284,877	834,964
2011	1,841,702	1,208,286	1,567,380	359,094	274,322	633,416
2012	3,346,794	1,672,985	2,811,353	1,138,368	535,441	1,673,809
2013	3,592,302	1,711,865	2,945,843	1,233,978	646,459	1,880,437
2014	3,237,025	1,354,211	2,498,436	1,144,226	738,588	1,882,814
2015	1,494,011	591,352	1,097,254	505,901	396,757	902,658
2016	650,542	148,859	494,420	345,561	156,122	501,683
TOTAL	73,768,410	58,028,782	68,428,185	10,399,403	5,340,225	15,739,628

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Development of Losses to Ultimate

RY	Development Period in Months																276 - ULT						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	
1994	1.748	1.035	1.099	1.064	1.087	1.000	1.188	1.063	1.046	1.136	1.039	0.962	0.938	1.054	1.022	1.352	0.998	1.000	1.000	1.000	0.994	1.000	1.000
1995	1.568	0.944	0.990	1.403	1.380	1.130	1.006	1.003	1.165	0.989	0.963	1.000	1.033	0.953	1.000	1.000	1.025	1.000	1.000	1.001	1.000	1.000	1.000
1996	1.115	1.062	1.088	1.277	0.983	1.123	0.973	1.014	0.948	1.021	1.057	0.930	1.031	1.011	1.001	1.010	0.996	1.014	1.035	1.000	1.000	1.000	1.000
1997	1.358	1.029	1.121	1.190	0.932	1.009	1.006	0.952	1.008	0.949	1.007	1.030	1.036	1.012	1.029	1.005	1.037	1.023	1.004	1.000	1.000	1.000	1.000
1998	0.968	1.227	0.936	1.000	1.053	1.001	0.983	1.009	1.012	1.045	1.014	1.016	1.012	1.008	0.997	0.993	1.066	1.050	1.006	1.000	1.000	1.000	1.000
1999	1.377	1.174	1.037	1.067	1.059	1.019	1.058	0.998	1.115	1.038	1.005	1.043	0.997	1.000	1.009	1.002	0.974	1.012	1.006	1.000	1.000	1.000	1.000
2000	1.307	1.026	1.352	1.020	0.960	1.014	0.989	0.994	1.014	1.019	1.004	1.023	1.021	1.000	1.039	1.011	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2001	0.774	1.045	1.094	0.950	1.013	1.048	0.988	1.032	1.007	1.037	1.006	1.014	0.990	1.000	1.031	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2002	1.087	1.233	1.062	0.999	1.008	1.177	0.980	1.001	1.007	1.023	1.019	0.998	0.985	1.015	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2003	0.866	1.069	1.034	1.077	0.986	0.979	0.990	0.992	1.055	0.996	1.003	1.003	1.011	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2004	0.726	1.002	0.957	1.153	0.996	0.915	1.012	1.022	1.037	1.008	1.020	1.029	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2005	0.999	1.065	0.965	0.916	1.003	0.977	1.047	1.044	0.963	0.984	1.044	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2006	0.697	0.925	1.016	1.121	0.979	0.945	0.958	1.009	0.962	0.985	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2007	1.129	0.948	0.943	0.962	1.063	1.019	1.010	1.028	1.090	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2008	0.720	0.880	1.052	1.089	1.010	1.024	0.994	1.105	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2009	0.825	0.842	0.957	1.023	0.974	1.022	0.998	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2010	0.696	0.928	0.970	1.076	1.062	1.073	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2011	0.832	1.000	1.031	0.966	1.093	1.018	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2012	0.858	0.963	1.329	1.028	1.013	1.018	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2013	0.761	1.148	1.009	1.024	1.013	1.018	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2014	0.746	1.081	1.062	1.024	1.013	1.018	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2015	2.636	1.051	1.062	1.024	1.013	1.018	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000
2016	0.966	1.051	1.062	1.024	1.013	1.018	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	187,103	327,100	338,664	372,338	396,280	430,925	430,925	512,003	544,249	569,328	646,825	671,833	646,361	606,161	639,180	653,025	882,676	881,282	881,282	881,282	881,282	875,960	875,960	875,960
1995	229,050	359,228	339,169	335,712	470,908	649,998	734,664	739,266	741,392	863,373	854,043	822,060	822,060	849,516	809,668	809,668	809,668	829,668	829,668	829,668	830,629	830,629	830,629	830,629
1996	2,074,608	2,312,993	2,456,425	2,673,073	3,413,485	3,354,566	3,767,622	3,665,813	3,718,947	3,524,021	3,596,366	3,799,750	3,534,045	3,643,349	3,685,176	3,687,940	3,723,882	3,707,363	3,757,936	3,887,596	3,887,596	3,887,596	3,887,596	3,887,596
1997	2,442,529	3,316,045	3,412,288	3,824,641	4,550,958	4,242,391	4,279,592	4,307,216	4,098,636	4,132,668	3,921,636	3,948,530	4,066,588	4,211,839	4,260,918	4,384,037	4,407,729	4,572,643	4,676,769	4,693,260	4,693,260	4,693,260	4,693,260	4,693,260
1998	3,675,965	3,559,113	4,365,735	4,088,438	4,086,851	4,304,774	4,307,747	4,235,040	4,274,042	4,324,783	4,519,773	4,581,805	4,653,835	4,710,482	4,749,789	4,737,115	4,702,682	5,014,309	5,265,050	5,297,002	5,297,002	5,297,002	5,297,002	5,297,002
1999	4,067,062	5,601,871	6,575,350	6,817,456	7,271,227	7,701,357	7,847,662	8,301,935	8,284,562	9,236,158	9,590,694	9,635,104	10,051,467	10,019,020	10,022,011	10,110,720	10,135,116	9,873,136	9,992,971	10,053,616	10,053,616	10,053,616	10,053,616	10,053,616
2000	2,762,343	3,611,594	3,705,600	5,011,259	5,112,429	4,908,784	4,977,899	4,921,943	4,894,275	4,961,257	5,054,309	5,076,112	5,193,017	5,303,446	5,303,354	5,511,724	5,574,262	5,625,375	5,693,653	5,728,207	5,728,207	5,728,207	5,728,207	5,728,207
2001	2,251,558	1,743,446	1,822,201	1,993,523	1,894,340	1,918,963	2,011,132	1,987,488	2,052,066	2,067,276	2,144,617	2,157,214	2,187,052	2,164,958	2,164,958	2,231,893	2,240,695	2,261,241	2,288,687	2,302,577	2,302,577	2,302,577	2,302,577	2,302,577
2002	2,522,017	2,740,461	3,377,838	3,586,278	3,582,481	3,609,619	4,249,535	4,164,966	4,169,633	4,200,328	4,294,840	4,375,247	4,368,354	4,303,344	4,369,340	4,437,164	4,454,665	4,495,512	4,550,076	4,577,689	4,577,689	4,577,689	4,577,689	4,577,689
2003	2,947,566	2,552,226	2,729,345	2,821,402	3,038,665	2,996,630	2,935,032	2,905,668	2,883,632	3,043,090	3,031,155	3,041,419	3,049,245	3,081,544	3,098,089	3,146,180	3,158,589	3,187,552	3,226,241	3,245,820	3,245,820	3,245,820	3,245,820	3,245,820
2004	2,784,076	2,021,522	2,025,940	1,938,584	2,234,614	2,224,835	2,035,591	2,059,705	2,105,618	2,182,953	2,200,006	2,244,931	2,310,706	2,329,974	2,342,484	2,378,846	2,388,228	2,410,127	2,439,380	2,454,184	2,454,184	2,454,184	2,454,184	2,454,184
2005	2,418,554	2,416,450	2,572,849	2,483,026	2,274,631	2,281,970	2,229,537	2,333,344	2,437,114	2,347,584	2,309,022	2,411,172	2,442,764	2,463,133	2,476,358	2,514,798	2,524,716	2,547,867	2,578,791	2,594,441	2,594,441	2,594,441	2,594,441	2,594,441
2006	2,279,915	1,590,227	1,471,489	1,494,938	1,675,834	1,640,664	1,549,814	1,484,507	1,497,613	1,440,812	1,418,755	1,439,008	1,457,862	1,470,019	1,477,911	1,500,853	1,506,772	1,520,589	1,539,045	1,548,385	1,548,385	1,548,385	1,548,385	1,548,385
2007	3,103,989	3,505,775	3,323,381	3,132,793	3,014,940	3,205,988	3,265,791	3,297,252	3,387,988	3,692,463	3,751,724	3,805,281	3,855,138	3,887,284	3,908,156	3,968,821	3,984,475	4,021,010	4,069,815	4,094,514	4,094,514	4,094,514	4,094,514	4,094,514
2008	3,378,033	2,432,035	2,139,716	2,250,962	2,450,839	2,475,575	2,534,647	2,518,897	2,784,301	2,835,615	2,881,124	2,922,253	2,960,541	2,985,228	3,001,256	3,047,844	3,059,865	3,087,922	3,125,402	3,144,369	3,144,369	3,144,369	3,144,369	3,144,369
2009	2,770,198	2,286,030	1,923,883	1,840,582	1,883,630	1,833,921	1,873,872	1,869,496	1,902,888	1,937,958	1,969,061	1,997,170	2,023,337	2,040,209	2,051,163	2,083,002	2,091,218	2,110,393	2,136,008	2,148,971	2,148,971	2,148,971	2,148,971	2,148,971
2010	2,399,535	1,670,654	1,551,137	1,504,347	1,618,767	1,718,575	1,843,937	1,851,960	1,885,039	1,919,780	1,950,591	1,978,437	2,004,358	2,021,072	2,031,923	2,063,464	2,071,603	2,090,598	2,115,973	2,128,814	2,128,814	2,128,814	2,128,814	2,128,814
2011	1,730,234	1,440,222	1,440,536	1,484,741	1,433,817	1,567,380	1,595,246	1,602,187	1,630,805	1,660,860	1,687,516	1,711,606												

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Selection of Loss Development Factors

RY	Development Period in Months																						
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	
1994	1.748	1.035	1.099	1.064	1.087	1.000	1.188	1.063	1.046	1.136	1.039	0.962	0.938	1.054	1.022	1.352	0.998	1.000	1.000	1.000	0.994	1.000	
1995	1.568	0.944	0.990	1.403	1.380	1.130	1.006	1.003	1.165	0.989	0.963	1.000	1.033	0.953	1.000	1.000	1.025	1.000	1.000	1.001	1.000		
1996	1.115	1.062	1.088	1.277	0.983	1.123	0.973	1.014	0.948	1.021	1.057	0.930	1.031	1.011	1.001	1.010	0.996	1.014	1.035	1.000			
1997	1.358	1.029	1.121	1.190	0.932	1.009	1.006	0.952	1.008	0.949	1.007	1.030	1.036	1.012	1.029	1.005	1.037	1.023	1.004				
1998	0.968	1.227	0.936	1.000	1.053	1.001	0.983	1.009	1.012	1.045	1.014	1.016	1.012	1.008	0.997	0.993	1.066	1.050					
1999	1.377	1.174	1.037	1.067	1.059	1.019	1.058	0.998	1.115	1.038	1.005	1.043	0.997	1.000	1.009	1.002	0.974						
2000	1.307	1.026	1.352	1.020	0.960	1.014	0.989	0.994	1.014	1.019	1.004	1.023	1.021	1.000	1.039	1.011							
2001	0.774	1.045	1.094	0.950	1.013	1.048	0.988	1.032	1.007	1.037	1.006	1.014	0.990	1.000	1.031								
2002	1.087	1.233	1.062	0.999	1.008	1.177	0.980	1.001	1.007	1.023	1.019	0.998	0.985	1.015									
2003	0.866	1.069	1.034	1.077	0.986	0.979	0.990	0.992	1.055	0.996	1.003	1.003	1.011										
2004	0.726	1.002	0.957	1.153	0.996	0.915	1.012	1.022	1.037	1.008	1.020	1.029											
2005	0.999	1.065	0.965	0.916	1.003	0.977	1.047	1.044	0.963	0.984	1.044												
2006	0.697	0.925	1.016	1.121	0.979	0.945	0.958	1.009	0.962	0.985													
2007	1.129	0.948	0.943	0.962	1.063	1.019	1.010	1.028	1.090														
2008	0.720	0.880	1.052	1.089	1.010	1.024	0.994	1.105															
2009	0.825	0.842	0.957	1.023	0.974	1.022	0.998																
2010	0.696	0.928	0.970	1.076	1.062	1.073																	
2011	0.832	1.000	1.031	0.966	1.093																		
2012	0.858	0.963	1.329	1.028																			
2013	0.761	1.148	1.009																				
2014	0.746	1.081																					
2015	2.636																						
VOL WTD 3	0.868	1.069	1.117	1.024	1.037	1.037	1.001	1.051	1.022	0.993	1.021	1.007	0.994	1.006	1.021	1.003	1.011	1.030	1.016	1.000	0.997	1.000	
VOL WTD 5	0.860	1.036	1.062	1.039	1.038	1.018	1.004	1.044	1.032	1.003	1.018	1.013	1.001	1.004	1.018	1.004	1.009	1.027	1.014	1.000	0.997	1.000	
VOL WTD ALL	0.966	1.051	1.055	1.056	1.013	1.028	1.006	1.009	1.033	1.016	1.014	1.013	1.008	1.005	1.016	1.011	1.009	1.027	1.014	1.000	0.997	1.000	
ARITH 3	1.381	1.064	1.123	1.023	1.043	1.040	1.000	1.047	1.005	0.992	1.023	1.010	0.995	1.005	1.026	1.002	1.026	1.029	1.013	1.000	0.997	1.000	
ARITH 5	1.167	1.024	1.059	1.036	1.040	1.016	1.001	1.042	1.021	0.999	1.019	1.013	1.001	1.005	1.021	1.004	1.020	1.017	1.010	1.000	0.997	1.000	
ARITH ALL	1.082	1.030	1.052	1.073	1.036	1.028	1.011	1.018	1.031	1.018	1.015	1.004	1.005	1.006	1.016	1.053	1.016	1.017	1.010	1.000	0.997	1.000	
5 YR HI LO	0.817	1.015	1.003	1.042	1.045	1.021	1.000	1.031	1.018	0.996	1.015	1.013	0.999	1.003	1.023	1.006	1.019	1.012	1.002	1.000	NA	NA	TAIL
SELECTED	0.966	1.051	1.062	1.024	1.013	1.018	1.004	1.018	1.018	1.016	1.014	1.013	1.008	1.005	1.016	1.004	1.009	1.012	1.006	1.000	1.000	1.000	1.000

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Incurred Losses

RY	Development in Months																			
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
1994	187,103	327,100	338,664	372,338	396,280	430,925	430,925	512,003	544,249	569,328	646,825	671,833	646,361	606,161	639,180	653,025	882,676	881,282	881,282	881,282
1995	229,050	359,228	339,169	335,712	470,908	649,998	734,664	739,266	741,392	863,373	854,043	822,060	822,060	849,516	809,668	809,668	809,668	829,668	829,668	830,629
1996	2,074,608	2,312,993	2,456,425	2,673,073	3,413,485	3,354,566	3,767,622	3,665,813	3,718,947	3,524,021	3,596,366	3,799,750	3,534,045	3,643,349	3,685,176	3,687,940	3,723,882	3,707,363	3,757,936	3,887,596
1997	2,442,529	3,316,045	3,412,288	3,824,641	4,550,958	4,242,391	4,279,592	4,307,216	4,098,636	4,132,668	3,921,636	3,948,530	4,066,588	4,211,839	4,260,918	4,384,037	4,407,729	4,572,643	4,676,769	4,693,260
1998	3,675,965	3,559,113	4,365,735	4,088,438	4,086,851	4,304,774	4,307,747	4,235,040	4,274,042	4,324,783	4,519,773	4,581,805	4,653,835	4,710,482	4,749,789	4,737,115	4,702,682	5,014,309	5,014,309	5,014,309
1999	4,067,062	5,601,871	6,575,350	6,817,456	7,271,227	7,701,357	7,847,662	8,301,935	8,284,562	9,236,158	9,590,694	9,635,104	10,051,467	10,019,020	10,022,011	10,110,720	10,135,116	9,873,136		
2000	2,762,343	3,611,594	3,705,600	5,011,259	5,112,429	4,908,784	4,977,899	4,921,943	4,894,275	4,961,257	5,054,309	5,076,112	5,193,017	5,303,446	5,303,354	5,511,724	5,574,262			
2001	2,251,558	1,743,446	1,822,201	1,993,523	1,894,340	1,918,963	2,011,132	1,987,488	2,052,066	2,067,276	2,144,617	2,157,214	2,187,052	2,164,958	2,164,958	2,231,893				
2002	2,522,017	2,740,461	3,377,838	3,586,278	3,582,481	3,609,619	4,249,535	4,164,966	4,169,633	4,200,328	4,294,840	4,375,247	4,368,354	4,303,344	4,369,340					
2003	2,947,566	2,552,226	2,729,345	2,821,402	3,038,665	2,996,630	2,935,032	2,905,668	2,883,632	3,043,090	3,031,155	3,041,419	3,049,245	3,081,544						
2004	2,784,076	2,021,522	2,025,940	1,938,584	2,234,614	2,224,835	2,035,591	2,059,705	2,105,618	2,182,953	2,200,006	2,244,931	2,310,706							
2005	2,418,554	2,416,450	2,572,849	2,483,026	2,274,631	2,281,970	2,229,537	2,333,344	2,437,114	2,347,584	2,309,022	2,411,172								
2006	2,279,915	1,590,227	1,471,489	1,494,938	1,675,834	1,640,664	1,549,814	1,484,507	1,497,613	1,440,812	1,418,755									
2007	3,103,989	3,505,775	3,323,381	3,132,793	3,014,940	3,205,988	3,265,791	3,297,252	3,387,988	3,692,463										
2008	3,378,033	2,432,035	2,139,716	2,250,962	2,450,839	2,475,575	2,534,647	2,518,897	2,784,301											
2009	2,770,198	2,286,030	1,923,883	1,840,582	1,883,630	1,833,921	1,873,872	1,869,496												
2010	2,399,535	1,670,654	1,551,137	1,504,347	1,618,767	1,718,575	1,843,937													
2011	1,730,234	1,440,222	1,440,536	1,484,741	1,433,817	1,567,380														
2012	2,490,976	2,137,662	2,058,476	2,735,440	2,811,353															
2013	3,342,371	2,542,125	2,918,959	2,945,843																
2014	3,096,607	2,310,421	2,498,436																	
2015	416,272	1,097,254																		
2016	494,420																			

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>POLICIES</u> <u>IN FORCE</u>	<u>PURE</u> <u>PREMIUM</u>
2008	3,088,004	3,144,369	3,116,186	2,664	1,170
2009	2,603,096	2,148,971	2,376,033	2,662	893
2010	1,965,019	2,128,814	2,046,917	2,622	781
2011	1,934,360	1,841,702	1,888,031	2,623	720
2012	2,869,239	3,346,794	3,108,016	2,617	1,188
2013	3,436,757	3,592,302	3,514,530	2,603	1,350
2014	3,211,455	3,237,025	3,224,240	2,573	1,253
2015	1,933,120	1,494,011	1,713,566	2,530	677
2016	1,544,012	650,542	1,097,277	2,509	437
TOTAL	22,585,062	21,584,530	22,084,796	23,403	944

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2008	2,664	1,170	995	1,148	3,058,715	28.6%	875,826	2,203,792	3,079,617	2,784,301	295,316	580,509	1,156
2009	2,662	893	775	1,125	2,995,290	32.0%	957,385	1,771,068	2,728,453	1,869,496	858,957	98,428	1,025
2010	2,622	781	692	1,103	2,891,276	34.2%	987,540	1,293,850	2,281,390	1,843,937	437,453	550,087	870
2011	2,623	720	651	1,081	2,834,531	37.5%	1,063,959	1,208,286	2,272,245	1,567,380	704,865	359,094	866
2012	2,617	1,188	1,095	1,059	2,771,486	41.7%	1,155,498	1,672,985	2,828,483	2,811,353	17,130	1,138,368	1,081
2013	2,603	1,350	1,271	1,038	2,701,527	50.2%	1,355,883	1,711,865	3,067,749	2,945,843	121,905	1,233,978	1,179
2014	2,573	1,253	1,203	1,017	2,616,983	57.8%	1,513,450	1,354,211	2,867,661	2,498,436	369,225	1,144,226	1,115
2015	2,530	677	664	997	2,521,783	69.4%	1,750,356	591,352	2,341,708	1,097,254	1,244,455	505,901	926
2016	2,509	437	437	977	2,450,835	90.4%	2,214,549	148,859	2,363,408	494,420	1,868,988	345,561	942
TOTAL	23,403				24,842,426		11,874,446	11,956,268	23,830,714	17,912,419	5,918,294	5,956,152	1,018
	<u>Pure Premium Selection</u>				Trend =	0.980							
	3-Year Average x Latest			1,046									
	5-Year Average x Latest			977									
	All Year Average x Latest			918									
	Selected Pure Premium			977									

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Closure  
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<u>RY</u>	<u>POLICIES</u> <u>IN FORCE</u>	<u>PROJECTED</u> <u>PURE PREM</u>	<u>TRENDED</u> <u>PURE PREM</u>	<u>DETRENDED</u> <u>PURE PREM</u>	<u>EXPECTED</u> <u>LOSSES</u>	<u>PERCENT</u> <u>IBNR</u>	<u>EXPECTED</u> <u>IBNR</u>	<u>INCURRED</u> <u>LOSSES</u>	<u>INDICATED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSSES</u>	<u>UNPAID</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>ULTIMATE</u> <u>PURE PREM</u>
2008	2,664	1,170	995	1,148	3,058,715	11.5%	350,260	2,784,301	3,134,561	2,203,792	930,769	580,509	1,177
2009	2,662	893	775	1,125	2,995,290	13.0%	389,540	1,869,496	2,259,036	1,771,068	487,968	98,428	849
2010	2,622	781	692	1,103	2,891,276	13.4%	386,910	1,843,937	2,230,847	1,293,850	936,996	550,087	851
2011	2,623	720	651	1,081	2,834,531	14.9%	422,204	1,567,380	1,989,584	1,208,286	781,298	359,094	759
2012	2,617	1,188	1,095	1,059	2,771,486	16.0%	443,400	2,811,353	3,254,753	1,672,985	1,581,768	1,138,368	1,244
2013	2,603	1,350	1,271	1,038	2,701,527	18.0%	486,158	2,945,843	3,432,001	1,711,865	1,720,136	1,233,978	1,318
2014	2,573	1,253	1,203	1,017	2,616,983	22.8%	597,114	2,498,436	3,095,550	1,354,211	1,741,340	1,144,226	1,203
2015	2,530	677	664	997	2,521,783	26.6%	669,698	1,097,254	1,766,951	591,352	1,175,599	505,901	698
2016	2,509	437	437	977	2,450,835	24.0%	588,171	494,420	1,082,591	148,859	933,732	345,561	431
TOTAL	23,403				24,842,426		4,333,454	17,912,419	22,245,873	11,956,268	10,289,605	5,956,152	951

<u>Pure Premium Selection</u>	Trend =	0.980
3-Year Average x Latest		1,046
5-Year Average x Latest		977
All Year Average x Latest		918
Selected Pure Premium		977

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>
1994	2,993,878	3,142,787	2,757,576	3,142,787	385,211	-
1995	3,084,788	3,084,788	2,811,884	2,883,696	71,812	201,092
1996	2,381,278	2,381,278	2,139,915	2,344,436	204,521	36,842
1997	4,033,353	4,033,353	3,559,664	3,708,217	148,553	325,136
1998	2,758,818	2,905,273	2,382,158	2,905,273	523,116	-
1999	3,112,983	3,112,983	2,627,746	2,750,103	122,357	362,880
2000	4,155,834	4,155,834	3,426,721	3,878,829	452,109	277,005
2001	997,643	1,069,609	805,227	1,069,609	264,382	-
2002	4,454,936	4,454,936	3,483,473	4,218,927	735,454	236,009
2003	3,364,032	3,364,032	2,565,592	3,111,514	545,922	252,518
2004	5,266,042	5,266,042	3,851,449	4,188,550	337,101	1,077,492
2005	2,211,693	2,211,693	1,535,671	1,801,967	266,296	409,726
2006	2,775,174	2,775,174	1,851,282	2,741,604	890,322	33,570
2007	1,248,574	1,248,574	765,632	867,453	101,821	381,121
2008	2,395,530	2,395,530	1,350,478	1,894,140	543,662	501,390
2009	1,721,767	1,721,767	884,880	943,038	58,159	778,729
2010	431,284	431,284	200,650	228,932	28,283	202,352
2011	1,261,386	1,261,386	510,173	1,230,702	720,529	30,684
2012	1,295,455	1,295,455	438,523	607,983	169,460	687,472
2013	1,238,993	1,238,993	310,824	636,393	325,569	602,600
2014	836,395	836,395	133,385	285,522	152,136	550,874
2015	5,203,010	5,203,010	692,863	1,532,384	839,521	3,670,626
2016	2,570,305	2,570,305	39,426	875,404	835,978	1,694,901
TOTAL	59,793,151	60,160,482	39,125,189	47,847,461	8,722,272	12,313,021



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Development of Losses to Ultimate

Development Period in Months																							
RY	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - ULT
1994		1.566	2.122	1.438	1.840	1.224	1.340	1.256	1.374	1.033	1.027	1.066	1.045	1.062	1.057	1.055	1.027	1.035	1.030	1.016	1.043	1.010	1.086
1995	3.760	1.734	1.593	1.161	1.131	1.269	1.382	1.086	1.093	1.276	1.062	1.051	1.033	1.037	1.032	1.021	1.022	1.024	1.014	1.015	1.001	1.010	1.086
1996		2.391	4.177	1.897	1.678	1.269	1.332	1.060	1.130	1.071	1.029	1.053	1.054	1.140	1.002	1.054	1.034	1.094	1.043	1.081	1.014	1.010	1.086
1997	520.511	1.681	1.601	1.318	1.251	1.227	1.559	1.130	1.061	1.178	1.027	1.023	1.046	1.081	1.029	1.036	1.015	1.005	1.008	1.018	1.014	1.010	1.086
1998	18.330	1.363	1.853	1.780	1.198	1.171	1.075	1.059	1.104	1.156	1.118	1.118	1.199	1.046	1.167	1.015	1.092	1.081	1.022	1.018	1.014	1.010	1.086
1999	3.453	1.116	1.035	1.044	1.071	1.044	1.043	1.153	1.042	1.074	1.049	1.032	1.027	1.020	1.019	1.012	1.004	1.023	1.022	1.018	1.014	1.010	1.086
2000	8.917	1.206	1.216	1.172	1.090	1.079	1.091	1.076	1.157	1.053	1.017	1.032	1.036	1.009	1.034	1.025	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2001	1.729	1.108	1.687	1.112	1.158	1.220	1.100	1.171	1.005	1.045	1.023	1.028	1.025	1.010	1.033	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2002	3.256	2.453	2.032	1.367	1.642	1.240	1.180	1.126	1.054	1.044	1.077	1.079	1.065	1.072	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2003	3.629	2.485	1.410	1.189	1.228	1.199	1.072	1.100	1.068	1.027	1.049	1.080	1.108	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2004	6.103	1.809	1.261	1.316	1.260	1.135	1.132	1.107	1.123	1.052	1.041	1.049	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2005	5.222	2.259	1.250	1.104	1.109	1.018	1.046	1.033	1.054	1.103	1.033	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2006	100.428	1.629	1.471	1.443	1.147	1.195	1.128	1.059	1.101	1.326	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2007	45.101	1.733	1.075	1.017	1.041	1.044	1.029	1.102	1.029	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2008		1.535	1.328	1.727	1.493	1.274	1.276	1.178	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2009	2.291	1.458	1.263	1.107	1.204	1.079	1.036	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2010		2.208	2.273	1.135	1.042	1.130	1.105	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2011	2.002	2.024	1.869	1.704	1.133	1.150	1.105	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2012	6.056	1.931	1.627	1.289	1.195	1.150	1.105	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2013		2.029	1.850	1.349	1.195	1.150	1.105	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2014		3.013	1.573	1.349	1.195	1.150	1.105	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086
2015	5.351	2.142	1.148	1.180	1.166	1.089	1.088	1.130	1.082	1.063	1.045	1.040	1.035	1.022	1.026	1.017	1.014	1.023	1.022	1.018	1.014	1.010	1.086
2016	4.853	2.142	1.573	1.349	1.195	1.150	1.105	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	-	67,556	105,762	224,445	322,720	593,891	727,102	973,960	1,223,383	1,680,534	1,736,151	1,783,144	1,901,121	1,985,974	2,108,783	2,229,646	2,353,177	2,416,592	2,500,825	2,575,464	2,617,719	2,729,017	2,757,576	2,993,878
1995	57,146	214,861	372,610	593,564	689,047	779,151	988,375	1,365,685	1,483,319	1,621,206	2,068,109	2,195,718	2,307,489	2,384,650	2,474,037	2,554,120	2,607,829	2,663,932	2,728,277	2,767,464	2,808,933	2,811,884	2,841,310	3,084,788
1996	-	17,700	42,316	176,760	335,328	562,825	713,987	950,907	1,008,006	1,138,950	1,219,963	1,255,045	1,321,564	1,392,644	1,587,262	1,590,384	1,676,801	1,734,357	1,897,262	1,979,584	2,139,915	2,170,612	2,193,327	2,381,278
1997	439	228,598	384,266	615,310	810,739	1,014,623	1,245,366	1,941,775	2,211,344	2,345,205	2,763,348	2,836,923	2,901,679	3,033,730	3,280,943	3,376,266	3,462,906	3,516,084	3,532,892	3,559,664	3,624,538	3,676,532	3,715,007	4,033,353
1998	6,465	118,511	161,556	299,311	532,819	638,505	747,760	804,023	851,858	940,596	1,087,299	1,215,530	1,359,258	1,629,754	1,704,629	1,989,855	2,018,841	2,204,678	2,382,158	2,434,814	2,479,188	2,514,752	2,541,069	2,758,818
1999	357,471	1,234,237	1,376,895	1,425,317	1,488,590	1,594,064	1,663,943	1,736,098	2,001,842	2,085,194	2,238,708	2,349,101	2,424,075	2,490,058	2,539,119	2,586,804	2,618,422	2,627,746	2,687,969	2,747,385	2,797,456	2,837,585	2,867,280	3,112,983
2000	114,187	1,018,212	1,227,935	1,493,269	1,750,358	1,908,405	2,059,006	2,247,037	2,418,072	2,797,305	2,945,750	2,995,139	3,091,814	3,203,887	3,233,491	3,344,627	3,426,721	3,508,043	3,588,440	3,667,761	3,734,605	3,788,178	3,827,821	4,155,834
2001	104,196	180,134	199,654	336,731	374,550	433,710	529,272	581,958	681,517	684,727	715,780	732,297	752,978	771,454	779,324	805,227	822,613	842,135	861,435	880,477	896,523	909,384	918,900	997,643
2002	39,750	129,433	317,549	645,166	881,959	1,448,299	1,795,420	2,119,144	2,385,722	2,515,613	2,626,157	2,827,608	3,051,616	3,249,469	3,483,473	3,595,712	3,673,347	3,760,521	3,846,706	3,931,735	4,003,390	4,060,818	4,103,315	4,454,936
2003	70,930	257,387	639,714	902,054	1,073,965	1,317,164	1,579,451	1,692,868	1,861,811	1,989,247	2,043,300	2,143,512	2,315,479	2,565,592	2,630,456	2,715,211	2,773,835	2,839,662	2,904,742	2,968,950	3,032,058	3,066,424	3,098,514	3,364,032
2004	90,918	554,838	1,003,934	1,265,633	1,665,587	2,099,306	2,382,002	2,697,142	2,987,009	3,355,323	3,528,803	3,673,274	3,851,449	4,016,167	4,117,705	4,250,380	4,342,149	4,445,196	4,547,072	4,647,582	4,732,283	4,800,168	4,850,402	5,266,042
2005	64,509	336,850	760,805	951,148	1,049,818	1,164,238	1,184,748	1,238,896	1,279,491	1,348,838	1,487,208	1,535,671	1,617,576	1,686,757	1,729,402	1,785,124	1,823,666	1,866,945	1,909,732	1,951,946	1,987,519	2,016,030	2,037,128	2,211,693
2006	2,233	224,299	365,337	537,313	775,151	888,935	1,062,080	1,197,945	1,268,221	1,395,888	1,851,282	1,926,919	2,029,691	2,116,497	2,170,007	2,239,926	2,288,288	2,342,593	2,396,281	2,449,249	2,493,886	2,529,661	2,556,134	2,775,174
2007	7,065	318,642	552,262	593,816	603,938	628,469	656,318	675,212	744,229	765,632	832,907	866,937	913,175	952,230	976,305	1,007,762	1,029,520	1,053,952	1,078,107	1,101,938	1,122,021	1,138,116	1,150,026	1,248,574
2008	-	134,080	205,854	273,370	472,091	704,738	898,168	1,146,107	1,350,478	1,468,591	1,598,026	1,663,317	1,752,030	1,826,961	1,873,150	1,933,504	1,975,250	2,022,126	2,068,470	2,114,192	2,152,723	2,183,603	2,206,455	2,395,530
2009	140,848	322,681	470,506	594,291	657,716	792,191	854,383	884,880	970,645	1,055,796	1,148,568	1,195,495	1,259,257	1,313,113	1,346,311	1,389,690	1,419,695	1,453,386	1,486,695	1,519,558	1,547,251	1,569,447	1,585,871	1,721,767
2010	-	29,916	66,069	150,177	170,474	177,574	200,650	221,653	243,136	264,466	287,704	299,459	315,430	328,921	337,237	348,102	355,618	364,058	372,401	380,633	387,570	393,130	397,244	431,284
2011	34,886	69,855	141,373	264,278	450,244	510,173	586,844	648,273	711,105	773,488	841,454	875,833	922,545	962,001	986,322	1,018,102	1,040,084	1,064,767	1,089,169	1,113,245	1,133,534	1,149,794	1,161,827	1,261,386
2012	17,882	108,288	2																					

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Selection of Loss Development Factors

RY	Development Period in Months																						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	
1994		1.566	2.122	1.438	1.840	1.224	1.340	1.256	1.374	1.033	1.027	1.066	1.045	1.062	1.057	1.055	1.027	1.035	1.030	1.016	1.043	1.010	
1995	3.760	1.734	1.593	1.161	1.131	1.269	1.382	1.086	1.093	1.276	1.062	1.051	1.033	1.037	1.032	1.021	1.022	1.024	1.014	1.015	1.001		
1996		2.391	4.177	1.897	1.678	1.269	1.332	1.060	1.130	1.071	1.029	1.053	1.054	1.140	1.002	1.054	1.034	1.094	1.043	1.081			
1997	520.511	1.681	1.601	1.318	1.251	1.227	1.559	1.139	1.061	1.178	1.027	1.023	1.046	1.081	1.029	1.026	1.015	1.005	1.008				
1998	18.330	1.363	1.853	1.780	1.198	1.171	1.075	1.059	1.104	1.156	1.118	1.118	1.199	1.046	1.167	1.015	1.092	1.081					
1999	3.453	1.116	1.035	1.044	1.071	1.044	1.043	1.153	1.042	1.074	1.049	1.032	1.027	1.020	1.019	1.012	1.004						
2000	8.917	1.206	1.216	1.172	1.090	1.079	1.091	1.076	1.157	1.053	1.017	1.032	1.036	1.009	1.034	1.025							
2001	1.729	1.108	1.687	1.112	1.158	1.220	1.100	1.171	1.005	1.045	1.023	1.028	1.025	1.010	1.033								
2002	3.256	2.453	2.032	1.367	1.642	1.240	1.180	1.126	1.054	1.044	1.077	1.079	1.065	1.072									
2003	3.629	2.485	1.410	1.189	1.228	1.199	1.072	1.100	1.068	1.027	1.049	1.080	1.108										
2004	6.103	1.809	1.261	1.316	1.260	1.135	1.132	1.107	1.123	1.052	1.041	1.049											
2005	5.222	2.259	1.250	1.104	1.109	1.018	1.046	1.033	1.054	1.103	1.033												
2006	100.428	1.629	1.471	1.443	1.147	1.195	1.128	1.059	1.101	1.326													
2007	45.101	1.733	1.075	1.017	1.041	1.044	1.029	1.102	1.029														
2008		1.535	1.328	1.727	1.493	1.274	1.276	1.178															
2009	2.291	1.458	1.263	1.107	1.204	1.079	1.036																
2010		2.208	2.273	1.135	1.042	1.130																	
2011	2.002	2.024	1.869	1.704	1.133																		
2012	6.056	1.931	1.627	1.289																			
2013		2.029	1.850																				
2014		3.013																					
2015	5.351																						
VOL WTD 3	6.332	2.169	1.765	1.404	1.158	1.166	1.123	1.114	1.066	1.126	1.042	1.066	1.076	1.038	1.028	1.018	1.031	1.048	1.018	1.033	1.021	1.010	
VOL WTD 5	5.476	2.142	1.573	1.349	1.195	1.150	1.105	1.097	1.088	1.088	1.049	1.056	1.055	1.035	1.049	1.025	1.029	1.040	1.021	1.033	1.021	1.010	
VOL WTD ALL	4.853	1.564	1.367	1.245	1.223	1.152	1.166	1.112	1.101	1.101	1.044	1.053	1.060	1.052	1.043	1.028	1.029	1.040	1.021	1.033	1.021	1.010	
ARITH 3	5.351	2.325	1.782	1.376	1.126	1.161	1.114	1.113	1.061	1.160	1.041	1.069	1.066	1.030	1.029	1.017	1.037	1.060	1.022	1.037	1.022	1.010	
ARITH 5	4.470	2.241	1.776	1.392	1.183	1.144	1.103	1.096	1.075	1.110	1.044	1.054	1.052	1.031	1.057	1.026	1.033	1.048	1.024	1.037	1.022	1.010	
ARITH ALL	46.009	1.844	1.700	1.333	1.262	1.166	1.176	1.114	1.100	1.111	1.046	1.056	1.064	1.053	1.047	1.030	1.032	1.048	1.024	1.037	1.022	1.010	
5 YR HI LO	5.351	2.087	1.782	1.376	1.126	1.134	1.070	1.089	1.074	1.066	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.047	1.022	1.016	NA	NA	
SELECTED	4.853	2.142	1.573	1.349	1.195	1.150	1.105	1.097	1.088	1.088	1.041	1.053	1.043	1.025	1.032	1.022	1.024	1.023	1.022	1.018	1.014	1.010	1.086

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Paid Losses

RY	Development in Months																						
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276
1994	-	67,556	105,762	224,445	322,720	593,891	727,102	973,960	1,223,383	1,680,534	1,736,151	1,783,144	1,901,121	1,985,974	2,108,783	2,229,646	2,353,177	2,416,592	2,500,825	2,575,464	2,617,719	2,729,017	2,757,576
1995	57,146	214,861	372,610	593,564	689,047	779,151	988,375	1,365,685	1,483,319	1,621,206	2,068,109	2,195,718	2,307,489	2,384,650	2,474,037	2,554,120	2,607,829	2,663,932	2,728,277	2,767,464	2,808,933	2,811,884	
1996	-	17,700	42,316	176,760	335,328	562,825	713,987	950,907	1,008,006	1,138,950	1,219,963	1,255,045	1,321,564	1,392,644	1,587,262	1,590,384	1,676,801	1,734,357	1,897,262	1,979,584	2,139,915		
1997	439	228,598	384,266	615,310	810,739	1,014,623	1,245,366	1,941,775	2,211,344	2,345,205	2,763,348	2,836,923	2,901,679	3,033,730	3,280,943	3,376,266	3,462,906	3,516,084	3,532,892	3,559,664			
1998	6,465	118,511	161,556	299,311	532,819	638,505	747,760	804,023	851,858	940,596	1,087,299	1,215,530	1,359,258	1,629,754	1,704,629	1,989,855	2,018,841	2,204,678	2,382,158				
1999	357,471	1,234,237	1,376,895	1,425,317	1,488,590	1,594,064	1,663,943	1,736,098	2,001,842	2,085,194	2,238,708	2,349,101	2,424,075	2,490,058	2,539,119	2,586,804	2,618,422	2,627,746					
2000	114,187	1,018,212	1,227,935	1,493,269	1,750,358	1,908,405	2,059,006	2,247,037	2,418,072	2,797,305	2,945,750	2,995,139	3,091,814	3,203,887	3,233,491	3,344,627	3,426,721						
2001	104,196	180,134	199,654	336,731	374,550	433,710	529,272	581,958	681,517	684,727	715,780	732,297	752,978	771,454	779,324	805,227							
2002	39,750	129,433	317,549	645,166	881,959	1,448,299	1,795,420	2,119,144	2,385,722	2,515,613	2,626,157	2,827,608	3,051,616	3,249,469	3,483,473								
2003	70,930	257,387	639,714	902,054	1,072,965	1,317,164	1,579,451	1,692,868	1,861,811	1,989,247	2,043,300	2,143,512	2,315,479	2,565,592									
2004	90,918	554,838	1,003,934	1,265,633	1,665,587	2,099,306	2,382,002	2,697,142	2,987,009	3,355,323	3,528,803	3,673,274	3,851,449										
2005	64,509	336,850	760,805	951,148	1,049,818	1,164,238	1,184,748	1,238,896	1,279,491	1,348,838	1,487,208	1,535,671											
2006	2,233	224,299	365,337	537,313	775,151	888,935	1,062,080	1,197,945	1,268,221	1,395,888	1,851,282												
2007	7,065	318,642	552,262	593,816	603,938	628,469	656,318	675,212	744,229	765,632													
2008	-	134,080	205,854	273,370	472,091	704,738	898,168	1,146,107	1,350,478														
2009	140,848	322,681	470,506	594,291	657,716	792,191	854,383	884,880															
2010	-	29,916	66,069	150,177	170,474	177,574	200,650																
2011	34,886	69,855	141,373	264,278	450,244	510,173																	
2012	17,882	108,288	209,139	340,184	438,523																		
2013	-	82,788	168,015	310,824																			
2014	-	44,273	133,385																				
2015	129,482	692,863																					
2016	39,426																						

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	3,142,787	2,757,576	3,142,787	385,211	-	385,211
1995	2,903,930	2,811,884	2,883,696	71,812	20,234	92,046
1996	2,381,593	2,139,915	2,344,436	204,521	37,158	241,678
1997	3,808,289	3,559,664	3,708,217	148,553	100,073	248,625
1998	3,024,567	2,382,158	2,905,273	523,116	119,294	642,409
1999	2,912,071	2,627,746	2,750,103	122,357	161,968	284,325
2000	4,126,171	3,426,721	3,878,829	452,109	247,342	699,451
2001	1,157,042	805,227	1,069,609	264,382	87,432	351,814
2002	4,605,811	3,483,473	4,218,927	735,454	386,884	1,122,338
2003	3,573,153	2,565,592	3,111,514	545,922	461,639	1,007,561
2004	4,897,180	3,851,449	4,188,550	337,101	708,630	1,045,731
2005	2,096,300	1,535,671	1,801,967	266,296	294,333	560,629
2006	3,265,175	1,851,282	2,741,604	890,322	523,571	1,413,893
2007	1,073,261	765,632	867,453	101,821	205,809	307,629
2008	2,492,079	1,350,478	1,894,140	543,662	597,939	1,141,601
2009	1,310,658	884,880	943,038	58,159	367,620	425,779
2010	342,944	200,650	228,932	28,283	114,012	142,295
2011	1,963,501	510,173	1,230,702	720,529	732,799	1,453,328
2012	1,053,169	438,523	607,983	169,460	445,186	614,646
2013	1,222,391	310,824	636,393	325,569	585,998	911,567
2014	713,917	133,385	285,522	152,136	428,396	580,532
2015	3,884,810	692,863	1,532,384	839,521	2,352,426	3,191,947
2016	3,421,162	39,426	875,404	835,978	2,545,758	3,381,736
TOTAL	59,371,962	39,125,189	47,847,461	8,722,272	11,524,501	20,246,773

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Development of Losses to Ultimate

RY	Development Period in Months																276 - ULT						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	
1994	15,451	1,018	1,063	1,379	1,386	1,238	0,981	1,166	1,020	0,997	0,977	0,872	1,009	1,044	0,972	1,047	0,992	1,021	1,045	1,023	1,052	1,008	1,000
1995	1,245	0,927	1,155	0,988	1,043	1,069	1,204	0,975	1,001	1,145	0,992	1,010	1,043	0,997	1,033	1,005	1,012	0,983	1,008	1,000	1,002	1,007	1,000
1996	0,783	1,411	1,368	1,380	1,056	1,117	1,105	1,027	1,010	0,884	0,936	1,043	1,017	1,103	1,016	1,097	0,999	1,028	1,181	1,000	1,009	1,007	1,000
1997	1,860	1,230	1,198	1,413	1,137	1,171	1,111	1,037	1,003	1,089	1,016	0,971	1,084	1,034	1,005	1,005	1,002	1,014	1,002	1,011	1,009	1,007	1,000
1998	1,032	0,989	1,073	1,294	1,108	1,049	1,241	1,024	1,091	0,997	1,032	0,982	1,077	1,312	1,061	1,018	1,079	1,017	1,014	1,011	1,009	1,007	1,000
1999	1,034	1,090	1,052	1,039	1,011	0,999	1,185	1,022	1,029	1,061	1,028	0,999	0,956	1,005	0,996	0,999	0,997	1,017	1,014	1,011	1,009	1,007	1,000
2000	1,255	1,096	1,119	1,055	1,021	1,029	1,063	1,049	1,044	1,051	1,024	1,025	1,000	1,014	0,998	1,028	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2001	0,974	0,874	1,046	1,005	1,062	1,075	0,986	1,015	0,991	1,000	1,020	1,034	1,000	1,109	1,000	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2002	1,015	1,073	0,969	1,211	1,074	1,037	1,026	1,103	1,039	1,026	1,089	1,034	1,013	1,024	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2003	0,931	1,129	1,067	0,881	1,164	1,048	1,003	1,017	0,993	1,093	1,063	1,007	0,996	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2004	0,775	1,030	1,089	1,071	1,138	1,004	1,096	1,069	1,092	1,005	1,022	0,997	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2005	1,822	1,024	1,042	0,960	0,988	1,032	1,023	1,000	1,013	1,029	1,038	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2006	1,179	1,012	1,064	1,204	0,991	1,005	1,076	1,091	1,163	1,066	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2007	0,859	0,861	0,898	1,026	1,003	1,019	1,041	1,139	1,000	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2008	1,322	1,079	1,064	1,291	1,135	1,181	1,126	1,115	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2009	0,836	0,960	1,056	1,041	1,068	1,009	0,984	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2010	1,292	1,275	1,339	1,000	1,000	1,038	1,078	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2011	1,186	0,941	2,132	1,086	1,074	1,065	1,078	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2012	1,319	1,158	1,159	1,093	1,086	1,065	1,078	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2013	1,390	0,989	1,040	1,109	1,086	1,065	1,078	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2014	1,602	0,891	1,302	1,109	1,086	1,065	1,078	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2015	1,891	1,014	1,302	1,109	1,086	1,065	1,078	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000
2016	1,542	1,014	1,302	1,109	1,086	1,065	1,078	1,056	1,063	1,039	1,024	0,995	1,018	1,052	1,009	1,017	1,005	1,017	1,014	1,011	1,009	1,007	1,000

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	65,047	1,005,018	1,023,016	1,087,349	1,499,341	2,078,139	2,573,685	2,525,449	2,944,082	3,003,278	2,995,177	2,924,889	2,550,436	2,574,369	2,688,316	2,614,164	2,736,632	2,714,782	2,772,423	2,896,698	2,962,023	3,116,839	3,142,787	3,142,787
1995	1,345,826	1,675,949	1,553,606	1,794,446	1,772,905	1,849,070	1,976,684	2,379,084	2,318,512	2,321,479	2,657,629	2,635,614	2,661,105	2,775,105	2,766,065	2,856,864	2,870,975	2,906,668	2,855,886	2,879,342	2,878,011	2,883,696	2,903,930	2,903,930
1996	634,958	497,443	701,793	959,776	1,324,610	1,399,259	1,562,675	1,726,825	1,773,459	1,791,890	1,583,674	1,482,276	1,546,632	1,573,321	1,734,904	1,761,831	1,933,421	1,932,111	1,985,403	2,344,436	2,344,436	2,364,999	2,381,593	2,381,593
1997	502,583	935,032	1,150,245	1,378,150	1,947,336	2,214,227	2,591,866	2,880,119	2,986,984	2,997,120	3,265,114	3,318,830	3,221,107	3,492,440	3,610,025	3,626,882	3,643,635	3,651,096	3,700,587	3,708,217	3,748,873	3,781,754	3,808,289	3,808,289
1998	752,604	776,480	767,994	823,905	1,066,204	1,181,568	1,239,878	1,538,625	1,576,160	1,719,015	1,713,432	1,768,332	1,735,967	1,869,464	2,452,683	2,602,586	2,649,256	2,857,819	2,905,273	2,945,089	2,977,738	3,003,492	3,024,567	3,024,567
1999	1,712,508	1,770,639	1,930,013	2,030,050	2,108,225	2,131,472	2,129,530	2,523,004	2,577,625	2,653,444	2,814,130	2,892,443	2,889,189	2,760,814	2,773,420	2,761,910	2,758,547	2,750,103	2,797,214	2,835,549	2,866,637	2,891,780	2,912,071	2,912,071
2000	1,698,608	2,131,795	2,337,379	2,616,121	2,758,703	2,816,918	2,899,853	3,083,798	3,236,082	3,377,793	3,550,236	3,636,238	3,725,592	3,779,290	3,772,662	3,878,829	3,896,675	3,963,428	4,017,746	4,061,795	4,097,421	4,126,171	4,126,171	
2001	903,017	879,435	768,432	803,398	807,374	857,373	921,857	909,006	922,903	914,707	914,707	932,652	964,133	964,133	1,069,609	1,069,609	1,087,683	1,092,687	1,111,406	1,126,637	1,138,989	1,148,979	1,157,042	1,157,042
2002	2,102,792	2,135,359	2,291,076	2,220,507	2,690,036	2,888,001	2,995,721	3,073,653	3,390,124	3,520,988	3,614,155	3,934,639	4,066,718	4,119,846	4,218,927	4,257,772	4,329,717	4,349,638	4,424,150	4,484,782	4,533,951	4,573,718	4,605,811	4,605,811
2003	2,188,347	2,037,947	2,300,433	2,453,916	2,162,594	2,516,185	2,638,216	2,645,657	2,689,486	2,669,997	2,918,788	3,102,947	3,124,594	3,111,514	3,273,011	3,303,146	3,358,961	3,374,416	3,432,222	3,479,259	3,517,405	3,548,256	3,573,153	3,573,153
2004	3,003,287	2,327,925	2,398,477	2,611,344	2,796,197	3,183,380	3,197,130	3,503,732	3,744,551	4,090,314	4,110,662	4,200,197	4,188,550	4,264,480	4,485,821	4,527,123	4,603,620	4,624,800	4,704,027	4,768,494	4,820,774	4,863,057	4,897,180	4,897,180
2005	855,094	1,558,332	1,595,861	1,662,314	1,596,329	1,577,303	1,627,822	1,664,850	1,665,200	1,687,550	1,736,223	1,801,967	1,825,465	1,920,213	1,937,893	1,970,638	1,979,705	2,013,619	2,041,215	2,063,594	2,081,694	2,096,300	2,096,300	2,096,300
2006	1,236,636	1,458,396	1,476,479	1,571,228	1,892,209	1,874,777	1,884,713	2,028,703	2,213,060	2,573,051	2,741,604	2,806,724	2,792,698	2,843,325	2,990,903	3,018,441	3,069,445	3,083,567	3,136,391	3,179,374	3,214,231	3,242,423	3,265,175	3,265,175
2007	1,049,030	901,475	776,584	697,298	715,705	717,904	731,520	761,453	867,453	867,453	901,164	922,569	917,959	934,600	983,108	992,160	1,008,925	1,013,567	1,030,930	1,045,059	1,056,516	1,065,783	1,073,261	1,073,261
2008	575,118	760,124	819,849	872,094	1,126,012	1,278,377	1,509,349	1,699,293	1,894,140	2,014,198	2,092,474	2,142,176	2,131,471	2,170,110	2,282,746	2,303,764	2,342,692	2,353,470	2,393,787	2,426,593	2,453,197	2,474,714	2,492,079	2,492,079
2009	997,723	834,376	800,801	853,741	888,872	949,649	958,396	943,038	996,185	1,059,327	1,100,494	1,126,634	1,121,004	1,141,326	1,200,564	1,211,618	1,232,091	1,237,760	1,258,964	1,276,217	1,290,209	1,301,526	1,310,658	1,310,658
2010	100,002	129,253	164,798	220,645	220,645	220,645	228,932	246,754	260,660	277,181	287,953	294,793	293,320	298,637	314,137	317,030	322,387	323,870	329,418	333,933	337,594	340,555	342,944	342,944
2011	443,503	526,138	494,996	1,055,259	1,146,204	1,230,702	1,310,733	1,412,768	1,492,387	1,586,980	1,648,653	1,687,813	1,709,379	1,798,568	1,815,128	1,845,799	1,854,292	1,886,057	1,911,					

Missouri Petroleum Storage Tank Insurance Fund  
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Insurance UST - Other  
Selection of Loss Development Factors

RY	Development Period in Months																						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	
1994	15.451	1.018	1.063	1.379	1.386	1.238	0.981	1.166	1.020	0.997	0.977	0.872	1.009	1.044	0.972	1.047	0.992	1.021	1.045	1.023	1.052	1.008	
1995	1.245	0.927	1.155	0.988	1.043	1.069	1.204	0.975	1.001	1.145	0.992	1.010	1.043	0.997	1.033	1.005	1.012	0.983	1.008	1.000	1.002		
1996	0.783	1.411	1.368	1.380	1.056	1.117	1.105	1.027	1.010	0.884	0.936	1.043	1.017	1.103	1.016	1.097	0.999	1.028	1.181	1.000			
1997	1.860	1.230	1.198	1.413	1.137	1.171	1.111	1.037	1.003	1.089	1.016	0.971	1.084	1.034	1.005	1.005	1.002	1.014	1.002				
1998	1.032	0.989	1.073	1.294	1.108	1.049	1.241	1.024	1.091	0.997	1.032	0.982	1.077	1.312	1.061	1.018	1.079	1.017					
1999	1.034	1.090	1.052	1.039	1.011	0.999	1.185	1.022	1.029	1.061	1.028	0.999	0.956	1.005	0.996	0.999	0.997						
2000	1.255	1.096	1.119	1.055	1.021	1.029	1.063	1.049	1.044	1.051	1.024	1.025	1.000	1.014	0.998	1.028							
2001	0.974	0.874	1.046	1.005	1.062	1.075	0.986	1.015	0.991	1.000	1.020	1.034	1.000	1.109	1.000								
2002	1.015	1.073	0.969	1.211	1.074	1.037	1.026	1.103	1.039	1.026	1.089	1.034	1.013	1.024									
2003	0.931	1.129	1.067	0.881	1.164	1.048	1.003	1.017	0.993	1.093	1.063	1.007	0.996										
2004	0.775	1.030	1.089	1.071	1.138	1.004	1.096	1.069	1.092	1.005	1.022	0.997											
2005	1.822	1.024	1.042	0.960	0.988	1.032	1.023	1.000	1.013	1.029	1.038												
2006	1.179	1.012	1.064	1.204	0.991	1.005	1.076	1.091	1.163	1.066													
2007	0.859	0.861	0.898	1.026	1.003	1.019	1.041	1.139	1.000														
2008	1.322	1.079	1.064	1.291	1.135	1.181	1.126	1.115															
2009	0.836	0.960	1.066	1.041	1.068	1.009	0.984																
2010	1.292	1.275	1.339	1.000	1.000	1.038																	
2011	1.186	0.941	2.132	1.086	1.074																		
2012	1.319	1.158	1.093																				
2013	1.390	0.989	1.040																				
2014	1.602	0.891																					
2015	1.891																						
VOL WTD 3	1.698	1.017	1.417	1.078	1.064	1.101	1.064	1.108	1.081	1.028	1.039	1.013	1.005	1.029	0.998	1.016	1.023	1.018	1.046	1.008	1.027	1.008	
VOL WTD 5	1.542	1.014	1.302	1.121	1.073	1.054	1.057	1.075	1.063	1.040	1.051	1.017	0.994	1.064	1.011	1.023	1.017	1.011	1.045	1.008	1.027	1.008	
VOL WTD ALL	1.150	1.044	1.101	1.109	1.086	1.065	1.078	1.056	1.039	1.039	1.024	0.995	1.018	1.052	1.009	1.024	1.013	1.011	1.045	1.008	1.027	1.008	
ARITH 3	1.628	1.013	1.444	1.060	1.047	1.076	1.050	1.115	1.059	1.033	1.041	1.013	1.003	1.049	0.998	1.015	1.026	1.019	1.064	1.007	1.027	1.008	
ARITH 5	1.478	1.051	1.347	1.102	1.056	1.050	1.050	1.083	1.052	1.044	1.046	1.019	0.993	1.093	1.012	1.029	1.018	1.012	1.059	1.007	1.027	1.008	
ARITH ALL	1.866	1.050	1.150	1.127	1.081	1.066	1.078	1.057	1.035	1.034	1.020	0.998	1.019	1.071	1.010	1.028	1.014	1.012	1.059	1.007	1.027	1.008	
5 YR HI LO	1.437	1.029	1.188	1.073	1.048	1.022	1.047	1.091	1.035	1.040	1.041	1.022	0.999	1.049	1.001	1.017	1.005	1.017	1.027	1.000	NA	NA	TAIL
SELECTED	1.542	1.014	1.302	1.109	1.086	1.065	1.078	1.056	1.063	1.039	1.024	0.995	1.018	1.052	1.009	1.017	1.005	1.017	1.014	1.011	1.009	1.007	1.000

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Incurred Losses

RY	Development in Months																				
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252
1994	65,047	1,005,018	1,023,016	1,087,349	1,499,341	2,078,139	2,573,685	2,525,449	2,944,082	3,003,278	2,995,177	2,924,889	2,550,436	2,574,369	2,688,316	2,614,164	2,736,632	2,714,782	2,772,423	2,896,698	2,962,023
1995	1,345,826	1,675,949	1,553,606	1,794,446	1,772,905	1,849,070	1,976,684	2,379,084	2,318,512	2,321,479	2,657,629	2,635,614	2,661,105	2,775,105	2,766,065	2,856,864	2,870,975	2,906,668	2,855,886	2,879,342	2,878,011
1996	634,958	497,443	701,793	959,776	1,324,610	1,399,259	1,562,675	1,726,825	1,773,459	1,791,890	1,583,674	1,482,276	1,546,632	1,573,321	1,734,904	1,761,831	1,933,421	1,932,111	1,985,403	2,344,436	2,344,436
1997	502,583	935,032	1,150,245	1,378,150	1,947,336	2,214,227	2,591,866	2,880,119	2,986,984	2,997,120	3,265,114	3,318,830	3,221,107	3,492,440	3,610,025	3,626,882	3,643,635	3,651,096	3,700,587	3,708,217	
1998	752,604	776,480	767,994	823,905	1,066,204	1,181,568	1,239,878	1,538,625	1,576,160	1,719,015	1,713,432	1,768,332	1,735,967	1,869,464	2,452,683	2,602,586	2,649,256	2,857,819	2,905,273		
1999	1,712,508	1,770,639	1,930,013	2,030,050	2,108,225	2,131,472	2,129,530	2,523,004	2,577,625	2,653,444	2,814,130	2,892,443	2,889,189	2,760,814	2,773,420	2,761,910	2,758,547	2,750,103			
2000	1,698,608	2,131,795	2,337,379	2,616,121	2,758,703	2,816,918	2,899,853	3,083,798	3,236,082	3,377,793	3,550,236	3,636,238	3,726,564	3,725,592	3,779,290	3,772,662	3,878,829				
2001	903,017	879,435	768,432	803,398	807,374	857,373	921,857	909,006	922,903	914,707	914,707	932,652	964,133	964,133	1,069,609	1,069,609					
2002	2,102,792	2,135,359	2,291,076	2,220,507	2,690,036	2,888,001	2,995,721	3,073,653	3,390,124	3,520,988	3,614,155	3,934,639	4,066,718	4,119,846	4,218,927						
2003	2,188,347	2,037,947	2,300,433	2,453,916	2,162,594	2,516,185	2,638,216	2,645,657	2,689,486	2,669,997	2,918,788	3,102,947	3,124,594	3,111,514							
2004	3,003,287	2,327,925	2,398,477	2,611,344	2,796,197	3,183,380	3,197,130	3,503,732	3,744,551	4,090,314	4,110,662	4,200,197	4,188,550								
2005	855,094	1,558,332	1,595,861	1,662,314	1,596,329	1,577,303	1,627,822	1,664,850	1,665,200	1,687,550	1,736,223	1,801,967									
2006	1,236,636	1,458,396	1,476,479	1,571,228	1,892,209	1,874,777	1,884,713	2,028,703	2,213,060	2,573,051	2,741,604										
2007	1,049,030	901,475	776,584	697,298	715,705	717,904	731,520	761,453	867,453												
2008	575,118	760,124	819,849	872,094	1,126,012	1,278,377	1,509,349	1,699,293	1,894,140												
2009	997,723	834,376	800,801	853,741	888,872	949,649	958,396	943,038													
2010	100,002	129,253	164,798	220,645	220,645	220,645	228,932														
2011	443,503	526,138	494,996	1,055,259	1,146,204	1,230,702															
2012	314,431	414,642	480,020	556,332	607,983																
2013	445,007	618,612	611,639	636,393																	
2014	200,006	320,413	285,522																		
2015	810,506	1,532,384																			
2016	875,404																				

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>POLICIES</u> <u>IN FORCE</u>	<u>PURE</u> <u>PREMIUM</u>
2008	2,395,530	2,492,079	2,443,804	2,664	917
2009	1,721,767	1,310,658	1,516,213	2,662	570
2010	431,284	342,944	342,944	2,622	131
2011	1,261,386	1,963,501	1,963,501	2,623	749
2012	1,295,455	1,053,169	1,053,169	2,617	402
2013	1,238,993	1,222,391	1,222,391	2,603	470
2014	836,395	713,917	713,917	2,573	277
2015	5,203,010	3,884,810	3,884,810	2,530	1,535
2016	2,570,305	3,421,162	3,421,162	2,509	1,364
TOTAL	16,954,127	16,404,631	16,561,911	23,403	708



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2008	2,664	917	1,255	546	1,454,391	43.6%	634,480	1,350,478	1,984,957	1,894,140	90,817	543,662	745
2009	2,662	570	750	568	1,511,431	48.6%	734,651	884,880	1,619,531	943,038	676,492	58,159	608
2010	2,622	131	165	590	1,548,269	53.5%	827,956	200,650	1,028,606	228,932	799,674	28,283	392
2011	2,623	749	911	614	1,610,813	59.6%	959,313	510,173	1,469,486	1,230,702	238,784	720,529	560
2012	2,617	402	471	639	1,671,414	66.1%	1,105,626	438,523	1,544,149	607,983	936,166	169,460	590
2013	2,603	470	528	664	1,728,971	74.9%	1,295,228	310,824	1,606,051	636,393	969,659	325,569	617
2014	2,573	277	300	691	1,777,407	84.1%	1,493,953	133,385	1,627,338	285,522	1,341,816	152,136	632
2015	2,530	1,535	1,597	718	1,817,611	92.6%	1,682,314	692,863	2,375,178	1,532,384	842,794	839,521	939
2016	2,509	1,364	1,364	747	1,874,625	98.5%	1,845,870	39,426	1,885,296	875,404	1,009,892	835,978	751
TOTAL	23,403				14,994,931		10,579,390	4,561,201	15,140,591	8,234,497	6,906,094	3,673,297	647
	<u>Pure Premium Selection</u>				Trend =	1.040							
	3-Year Average x Latest		808										
	5-Year Average x Latest		761										
	All Year Average x Latest		747										
	Selected Pure Premium		747										

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance UST - Other  
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	POLICIES	PROJECTED	TRENDED	DETRENDED	EXPECTED	PERCENT	EXPECTED	INCURRED	INDICATED	PAID	UNPAID	CASE	ULTIMATE
RY	IN FORCE	PURE PREM	PURE PREM	PURE PREM	LOSSES	IBNR	IBNR	LOSSES	ULTIMATE	LOSSES	LOSS	RESERVE	PURE PREM
2008	2,664	917	1,255	546	1,454,391	24.0%	348,960	1,894,140	2,243,100	1,350,478	892,623	543,662	842
2009	2,662	570	750	568	1,511,431	28.0%	423,934	943,038	1,366,972	884,880	482,092	58,159	514
2010	2,622	131	165	590	1,548,269	33.2%	514,724	228,932	743,656	200,650	543,006	28,283	284
2011	2,623	749	911	614	1,610,813	37.3%	601,172	1,230,702	1,831,874	510,173	1,321,701	720,529	698
2012	2,617	402	471	639	1,671,414	42.3%	706,525	607,983	1,314,508	438,523	875,985	169,460	502
2013	2,603	470	528	664	1,728,971	47.9%	828,846	636,393	1,465,239	310,824	1,154,415	325,569	563
2014	2,573	277	300	691	1,777,407	60.0%	1,066,557	285,522	1,352,078	133,385	1,218,693	152,136	525
2015	2,530	1,535	1,597	718	1,817,611	60.6%	1,100,644	1,532,384	2,633,028	692,863	1,940,165	839,521	1,041
2016	2,509	1,364	1,364	747	1,874,625	74.4%	1,394,947	875,404	2,270,351	39,426	2,230,926	835,978	905
TOTAL	23,403				14,994,931		6,986,310	8,234,497	15,220,807	4,561,201	10,659,606	3,673,297	650
	<u>Pure Premium Selection</u>				Trend =	1.040							
	3-Year Average x Latest			808									
	5-Year Average x Latest			761									
	All Year Average x Latest			747									
	Selected Pure Premium			747									

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>
1994	-	-	-	-	-	-
1995	131,709	114,027	114,027	114,027	-	-
1996	68,337,579	68,337,579	58,124,590	66,150,233	8,025,643	2,187,346
1997	9,324,278	9,324,278	7,767,216	8,608,820	841,604	715,459
1998	20,208,225	20,208,225	16,312,830	18,647,583	2,334,753	1,560,643
1999	8,802,904	8,802,904	6,982,923	8,144,203	1,161,279	658,702
2000	15,398,782	15,398,782	11,922,692	14,461,977	2,539,286	936,805
2001	2,548,588	2,629,369	1,922,955	2,629,369	706,414	-
2002	3,187,802	3,344,801	2,358,085	3,344,801	986,716	-
2003	1,158,699	1,158,699	833,873	1,141,225	307,352	17,474
2004	2,007,262	2,007,262	1,404,444	1,752,808	348,364	254,454
2005	3,302,119	3,302,119	2,236,223	2,777,459	541,236	524,660
2006	489,404	489,404	300,938	450,938	150,000	38,466
2007	1,691,149	1,691,149	1,006,421	1,264,959	258,538	426,191
2008	1,061,649	1,061,649	587,385	660,233	72,848	401,416
2009	1,168,376	1,168,376	612,576	794,122	181,546	374,254
2010	757,694	889,689	378,531	889,689	511,159	-
2011	1,746,667	1,763,581	813,135	1,763,581	950,446	-
2012	569,083	569,083	235,093	349,610	114,517	219,473
2013	1,414,558	1,414,558	510,062	942,049	431,987	472,509
2014	1,388,952	1,388,952	420,375	732,853	312,478	656,099
2015	210,207	379,643	37,773	379,643	341,871	-
2016	-	505,008	-	505,008	505,008	-
TOTAL	144,905,685	145,949,138	114,882,147	136,505,189	21,623,042	9,443,949

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Development of Losses to Ultimate

RY	Development Period in Months																						276 - U/LT	
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276		
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,138	
1995	-	-	-	-	-	-	-	9,287	1,127	1,000	1,241	1,000	1,041	1,014	1,069	1,000	1,000	1,000	1,000	1,000	1,000	1,015	1,138	
1996	20,724	3,266	2,407	2,036	1,409	1,264	1,161	1,143	1,103	1,082	1,072	1,051	1,076	1,061	1,043	1,032	1,031	1,021	1,035	1,021	1,018	1,015	1,138	
1997	16,836	2,049	1,602	1,266	1,153	1,071	1,019	1,041	1,041	1,021	1,095	1,027	1,040	1,046	1,018	1,013	1,006	1,012	1,012	1,021	1,018	1,015	1,138	
1998	12,647	2,010	1,342	1,146	1,074	1,053	1,029	1,071	1,035	1,080	1,051	1,056	1,031	1,025	1,017	1,018	1,019	1,010	1,032	1,021	1,018	1,015	1,138	
1999	4,821	1,254	1,276	1,187	1,132	1,024	1,044	1,039	1,066	1,103	1,056	1,032	1,019	1,020	1,016	1,012	1,013	1,018	1,032	1,021	1,018	1,015	1,138	
2000	2,319	1,409	1,202	1,169	1,115	1,077	1,140	1,034	1,054	1,044	1,028	1,027	1,031	1,030	1,030	1,027	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2001	-	3,234	1,268	1,346	1,120	1,179	1,166	1,155	1,112	1,047	1,052	1,037	1,017	1,018	1,009	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2002	10,139	2,111	1,125	1,147	1,072	1,092	1,039	1,043	1,094	1,033	1,046	1,078	1,043	1,070	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2003	2,817	1,576	1,195	1,149	1,129	1,151	1,063	1,049	1,089	1,032	1,076	1,029	1,063	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2004	4,773	1,326	1,368	1,217	1,136	1,111	1,059	1,037	1,046	1,032	1,043	1,015	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2005	3,426	1,446	1,590	1,161	1,212	1,132	1,037	1,039	1,095	1,041	1,261	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2006	4,337	3,865	1,419	1,348	1,051	1,042	1,000	1,000	1,000	1,000	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2007	41,628	3,049	1,218	1,215	1,257	1,101	1,081	1,141	1,098	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2008	4,194	1,048	1,204	1,247	1,256	1,030	1,086	1,045	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2009	3,022	1,570	1,139	1,055	1,015	1,097	1,034	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2010	-	1,835	1,081	1,363	1,047	1,069	1,049	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2011	2,766	1,844	1,117	1,100	1,081	1,073	1,049	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2012	1,407	1,134	1,101	1,134	1,107	1,043	1,078	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2013	5,111	1,534	1,499	1,146	1,127	1,073	1,049	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2014	13,888	1,678	1,191	1,146	1,127	1,073	1,049	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2015	-	1,684	1,191	1,146	1,127	1,073	1,049	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
2016	5,097	1,684	1,191	1,146	1,127	1,073	1,049	1,055	1,076	1,033	1,101	1,033	1,029	1,028	1,020	1,026	1,025	1,018	1,032	1,021	1,018	1,015	1,138	
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	U/LT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	7,781	72,262	81,424	81,424	101,034	101,034	105,196	106,705	114,027	114,027	114,027	114,027	114,027	114,027	114,027	115,757	131,709
1996	40,315	835,499	2,728,718	6,568,905	13,373,754	18,845,618	23,820,837	27,664,147	31,626,348	34,871,004	37,747,448	40,455,899	42,534,558	45,765,782	48,568,937	50,658,185	52,285,341	53,882,728	55,011,326	56,923,526	58,124,590	59,163,321	60,060,824	68,337,579
1997	61,400	1,033,729	2,118,455	3,394,699	4,296,273	4,951,705	5,303,380	5,403,843	5,623,039	5,851,196	5,972,517	6,542,594	6,722,493	6,993,563	7,314,218	7,443,710	7,541,990	7,586,859	7,674,403	7,767,216	7,930,773	8,072,502	8,194,962	9,324,278
1998	239,795	3,032,700	6,094,264	8,178,370	9,375,140	10,068,463	10,602,282	10,912,410	11,684,792	12,096,844	13,060,306	13,727,870	14,499,065	14,951,449	15,319,415	15,575,277	15,862,219	16,158,393	16,312,830	16,833,651	17,188,124	17,495,289	17,760,692	20,208,225
1999	436,835	2,105,831	2,641,761	3,370,046	3,998,601	4,527,780	4,838,276	4,843,173	5,032,565	5,366,728	5,917,688	6,249,511	6,450,553	6,574,295	6,705,452	6,809,966	6,893,063	6,982,923	7,106,031	7,332,906	7,487,318	7,621,122	7,736,734	8,802,904
2000	1,404,622	3,256,938	4,590,454	5,519,248	6,451,995	7,193,747	7,750,786	8,836,291	9,135,094	9,627,642	10,050,268	10,330,492	10,607,398	10,934,896	11,265,746	11,608,205	11,922,692	12,215,118	12,430,469	12,827,337	13,097,448	13,331,510	13,533,748	15,398,782
2001	-	147,472	476,981	604,628	813,801	911,192	1,074,243	1,252,777	1,447,406	1,609,378	1,685,756	1,773,480	1,839,082	1,870,679	1,904,981	1,922,955	1,973,275	2,021,673	2,057,315	2,122,999	2,167,704	2,206,442	2,239,914	2,548,588
2002	47,379	480,361	1,014,084	1,140,741	1,308,579	1,402,608	1,531,018	1,591,392	1,659,124	1,814,667	1,875,002	1,960,925	2,114,181	2,204,070	2,358,085	2,405,253	2,468,194	2,528,731	2,573,312	2,655,470	2,711,387	2,759,842	2,801,709	3,187,802
2003	71,422	201,172	317,027	378,728	435,080	491,064	565,402	600,804	630,373	686,253	708,407	762,255	784,155	833,873	857,114	874,259	897,136	919,140	935,345	965,208	985,532	1,003,145	1,018,362	1,158,699
2004	84,160	401,722	532,740	728,973	782,973	887,261	1,008,297	1,120,106	1,186,075	1,229,393	1,286,274	1,327,154	1,384,142	1,404,444	1,444,553	1,484,815	1,514,515	1,554,147	1,592,265	1,620,337	1,672,069	1,707,279	1,737,789	1,764,151
2005	115,085	394,303	570,217	906,812	1,053,062	1,275,950	1,444,651	1,497,871	1,556,506	1,704,631	1,773,966	2,236,223	2,310,432	2,376,414	2,442,648	2,491,507	2,556,705	2,619,413	2,665,593	2,750,698	2,808,620	2,858,812	2,902,180	3,302,119
2006	8,574	37,183	143,721	203,989	274,938	288,877	300,938	300,938	300,938	300,938	300,938	331,428	342,427	352,206	362,022	369,264	378,927	388,221	395,065	407,678	416,263	423,702	430,129	489,404
2007	2,861	119,076	363,029	442,068	537,077	674,872	743,159	803,483	916,913	1,006,421	1,039,900	1,145,261	1,183,266	1,217,058	1,250,979	1,276,002	1,309,393	1,341,508	1,365,158	1,408,744	1,438,408	1,464,114	1,486,324	1,691,149
2008	60,614	254,231	266,381	320,759	400,143	502,530	517,750	562,296	587,385	631,798	652,816	718,958	742,816	764,030	785,324	801,033	821,994	842,155	857,002	884,364	902,986	919,123	933,066	1,061,649
2009	93,362	282,127	442,836	504,349	532,197	540,101	592,613	612,576	646,435	695,313	718,444	791,235	817,491	840,838	864,273	881,561	904,629	926,817	943,157	973,269	993,764	1,011,523	1,026,868	1,168,376
2010	-	125,006	229,422	248,031	338,015	353,987	378,531	397,257	419,214															

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Selection of Loss Development Factors

RY	Development Period in Months																					
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276
1994								9.287	1.127	1.000	1.241	1.000	1.041	1.014	1.069	1.000	1.000	1.000	1.000	1.000	1.000	
1995																						
1996	20.724	3.266	2.407	2.036	1.409	1.264	1.161	1.143	1.103	1.082	1.072	1.051	1.076	1.061	1.043	1.032	1.031	1.021	1.035	1.021		
1997	16.836	2.049	1.602	1.266	1.153	1.071	1.019	1.041	1.041	1.021	1.095	1.027	1.040	1.046	1.018	1.013	1.006	1.012	1.012			
1998	12.647	2.010	1.342	1.146	1.074	1.053	1.029	1.071	1.035	1.080	1.051	1.056	1.031	1.025	1.017	1.018	1.019	1.010				
1999	4.821	1.254	1.276	1.187	1.132	1.024	1.044	1.039	1.066	1.103	1.056	1.032	1.019	1.020	1.016	1.012	1.013					
2000	2.319	1.409	1.202	1.169	1.115	1.077	1.140	1.034	1.054	1.044	1.028	1.027	1.031	1.030	1.030	1.027						
2001		3.234	1.268	1.346	1.120	1.179	1.166	1.155	1.112	1.047	1.052	1.037	1.017	1.018	1.009							
2002	10.139	2.111	1.125	1.147	1.072	1.092	1.039	1.043	1.094	1.033	1.046	1.078	1.043	1.070								
2003	2.817	1.576	1.195	1.149	1.129	1.151	1.063	1.049	1.089	1.032	1.076	1.029	1.063									
2004	4.773	1.326	1.368	1.217	1.136	1.111	1.059	1.037	1.046	1.032	1.043	1.015										
2005	3.426	1.446	1.590	1.161	1.212	1.132	1.037	1.039	1.095	1.041	1.261											
2006	4.337	3.865	1.419	1.348	1.051	1.042	1.000	1.000	1.000	1.000												
2007	41.628	3.049	1.218	1.215	1.257	1.101	1.081	1.141	1.098													
2008	4.194	1.048	1.204	1.247	1.256	1.030	1.086	1.045														
2009	3.022	1.570	1.139	1.055	1.015	1.097	1.034															
2010		1.835	1.081	1.363	1.047	1.069																
2011		2.766	1.844	1.117	1.100	1.081																
2012	13.380	1.407	1.134	1.101																		
2013	5.111	1.534	1.499																			
2014	13.888	1.678																				
2015																						
VOL WTD 3	8.303	1.566	1.234	1.157	1.052	1.066	1.067	1.083	1.086	1.033	1.150	1.048	1.036	1.035	1.023	1.020	1.014	1.018	1.032	1.021	1.000	NA
VOL WTD 5	5.097	1.684	1.191	1.146	1.127	1.073	1.049	1.055	1.076	1.033	1.101	1.033	1.029	1.028	1.020	1.026	1.025	1.018	1.032	1.021	1.000	NA
VOL WTD ALL	4.679	1.766	1.433	1.349	1.201	1.139	1.101	1.092	1.076	1.069	1.066	1.045	1.053	1.046	1.032	1.026	1.025	1.018	1.032	1.021	1.000	NA
ARITH 3	9.499	1.540	1.250	1.188	1.048	1.066	1.067	1.062	1.064	1.024	1.127	1.041	1.041	1.039	1.018	1.019	1.013	1.014	1.016	1.011	1.000	NA
ARITH 5	8.786	1.660	1.194	1.173	1.131	1.068	1.048	1.052	1.066	1.028	1.095	1.037	1.035	1.033	1.018	1.021	1.014	1.011	1.016	1.011	1.000	NA
ARITH ALL	9.813	1.974	1.344	1.250	1.141	1.100	1.068	1.052	1.074	1.043	1.093	1.035	1.040	1.036	1.029	1.017	1.014	1.011	1.016	1.011	1.000	NA
5 YR HI LO	9.245	1.683	1.130	1.149	1.128	1.069	1.051	1.040	1.077	1.032	1.058	1.031	1.031	1.025	1.017	1.020	1.013	1.011	1.012	NA	NA	TAIL
SELECTED	5.097	1.684	1.191	1.146	1.127	1.073	1.049	1.055	1.076	1.033	1.101	1.033	1.029	1.028	1.020	1.026	1.025	1.018	1.032	1.021	1.018	1.015
																						1.138

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Paid Losses

	Development in Months																						
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	7,781	72,262	81,424	81,424	101,034	101,034	105,196	106,705	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027
1996	40,315	835,499	2,728,718	6,568,905	13,373,754	18,845,618	23,820,837	27,664,147	31,626,348	34,871,004	37,747,448	40,455,899	42,534,558	45,765,782	48,568,937	50,658,185	52,285,341	53,882,728	55,011,326	56,923,526	58,124,590	58,124,590	58,124,590
1997	61,400	1,033,729	2,118,455	3,394,699	4,296,273	4,951,705	5,303,380	5,403,843	5,623,039	5,851,196	5,972,517	6,542,594	6,722,493	6,993,563	7,314,218	7,443,710	7,541,990	7,586,859	7,674,403	7,767,216	7,767,216	7,767,216	7,767,216
1998	239,795	3,032,700	6,094,264	8,178,370	9,375,140	10,068,463	10,602,282	10,912,410	11,684,792	12,096,844	13,060,306	13,727,870	14,499,065	14,951,449	15,319,415	15,575,277	15,862,219	16,158,393	16,312,830	16,312,830	16,312,830	16,312,830	16,312,830
1999	436,835	2,105,831	2,641,761	3,370,046	3,998,601	4,527,780	4,638,276	4,843,173	5,032,565	5,366,728	5,917,688	6,249,511	6,450,553	6,574,295	6,705,452	6,809,966	6,893,063	6,982,923	6,982,923	6,982,923	6,982,923	6,982,923	6,982,923
2000	1,404,622	3,256,938	4,590,454	5,519,248	6,451,995	7,193,747	7,750,786	8,836,291	9,135,094	9,627,642	10,050,268	10,330,492	10,607,398	10,934,896	11,265,746	11,608,205	11,922,692	11,922,692	11,922,692	11,922,692	11,922,692	11,922,692	11,922,692
2001	-	147,472	476,981	604,628	813,801	911,192	1,074,243	1,252,777	1,447,406	1,609,378	1,685,756	1,773,480	1,839,082	1,870,679	1,904,981	1,922,955	1,922,955	1,922,955	1,922,955	1,922,955	1,922,955	1,922,955	1,922,955
2002	47,379	480,361	1,014,084	1,140,741	1,308,579	1,402,608	1,531,018	1,591,392	1,659,124	1,814,667	1,875,002	1,960,925	2,114,181	2,204,070	2,358,085	2,358,085	2,358,085	2,358,085	2,358,085	2,358,085	2,358,085	2,358,085	2,358,085
2003	71,422	201,172	317,027	378,728	435,080	491,064	565,402	600,804	630,373	686,253	708,407	762,255	784,155	833,873	833,873	833,873	833,873	833,873	833,873	833,873	833,873	833,873	833,873
2004	84,160	401,722	532,740	728,973	887,261	1,008,297	1,120,106	1,186,075	1,229,393	1,286,274	1,327,154	1,384,142	1,404,444	1,404,444	1,404,444	1,404,444	1,404,444	1,404,444	1,404,444	1,404,444	1,404,444	1,404,444	1,404,444
2005	115,085	394,303	570,217	906,812	1,053,062	1,275,950	1,444,651	1,497,871	1,556,506	1,704,631	1,773,966	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223	2,236,223
2006	8,574	37,183	143,721	203,989	274,938	288,877	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938	300,938
2007	2,861	119,076	363,029	442,068	537,077	674,872	743,159	803,483	916,913	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421	1,006,421
2008	60,614	254,231	266,381	320,759	400,143	502,530	517,750	562,296	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385	587,385
2009	93,362	282,127	442,836	504,349	532,197	540,101	592,613	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576	612,576
2010	-	125,006	229,422	248,031	338,015	353,987	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531	378,531
2011	120,046	332,076	612,202	684,075	752,341	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135	813,135
2012	9,999	133,785	188,289	213,486	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093	235,093
2013	43,387	221,753	340,269	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062	510,062
2014	18,035	250,466	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375	420,375
2015	-	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773	37,773
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	-	-	-	-	-	-
1995	114,027	114,027	114,027	-	-	-
1996	66,150,233	58,124,590	66,150,233	8,025,643	-	8,025,643
1997	8,631,269	7,767,216	8,608,820	841,604	22,449	864,053
1998	18,920,310	16,312,830	18,647,583	2,334,753	272,727	2,607,480
1999	8,283,616	6,982,923	8,144,203	1,161,279	139,414	1,300,693
2000	15,072,191	11,922,692	14,461,977	2,539,286	610,213	3,149,499
2001	2,756,881	1,922,955	2,629,369	706,414	127,513	833,927
2002	3,538,667	2,358,085	3,344,801	986,716	193,866	1,180,582
2003	1,227,240	833,873	1,141,225	307,352	86,015	393,367
2004	1,889,495	1,404,444	1,752,808	348,364	136,687	485,051
2005	2,992,338	2,236,223	2,777,459	541,236	214,879	756,115
2006	486,679	300,938	450,938	150,000	35,741	185,741
2007	1,374,928	1,006,421	1,264,959	258,538	109,969	368,507
2008	714,124	587,385	660,233	72,848	53,891	126,739
2009	864,870	612,576	794,122	181,546	70,748	252,294
2010	983,456	378,531	889,689	511,159	93,766	604,925
2011	1,966,308	813,135	1,763,581	950,446	202,727	1,153,173
2012	398,451	235,093	349,610	114,517	48,842	163,358
2013	1,117,125	510,062	942,049	431,987	175,076	607,063
2014	876,113	420,375	732,853	312,478	143,260	455,738
2015	467,090	37,773	379,643	341,871	87,447	429,318
2016	690,356	-	505,008	505,008	185,348	690,356
TOTAL	139,515,766	114,882,147	136,505,189	21,623,042	3,010,577	24,633,619

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Development of Losses to Ultimate

RY	Development Period in Months																							
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252	252-264	264-276	276-ULT	
1994																								1,000
1995	1,000	1,000	1,000	1,000	1,000	1,000	1,000	3,677	1,000	1,321	1,000	1,000	1,000	1,000	0,939	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1996	0,902	1,033	0,991	1,067	1,057	1,024	1,022	0,986	0,975	1,004	0,996	1,019	1,016	1,030	1,013	1,015	1,034	1,021	1,013	1,003	1,000	1,000	1,000	1,000
1997	1,412	1,118	1,164	1,131	1,028	1,003	0,951	0,965	1,030	1,098	0,987	1,023	1,012	1,040	1,008	1,002	1,017	0,991	1,012	1,003	1,000	1,000	1,000	1,000
1998	1,204	1,386	1,084	1,038	1,045	0,968	1,004	1,048	1,012	1,016	1,052	1,024	1,027	1,042	1,012	1,001	1,040	1,005	1,012	1,003	1,000	1,000	1,000	1,000
1999	1,384	1,027	0,939	1,052	0,964	0,915	0,986	1,021	1,015	1,032	1,011	1,048	1,002	0,997	0,991	0,994	1,023	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2000	1,142	1,132	1,038	0,935	0,927	1,062	1,054	1,052	1,020	0,994	0,996	1,031	1,010	1,012	1,014	1,018	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2001	0,896	1,055	0,857	0,998	0,892	1,069	1,087	1,023	0,962	1,022	1,000	0,985	0,958	0,886	1,019	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2002	1,054	0,915	0,915	0,935	1,005	1,039	0,958	1,018	1,018	1,078	1,000	0,992	1,056	1,074	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2003	0,807	1,057	0,842	0,951	0,999	1,040	0,981	1,033	1,057	1,014	1,030	0,918	1,018	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2004	0,797	0,966	1,014	1,054	0,994	0,990	0,961	1,022	0,990	0,966	0,989	0,990	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2005	0,935	0,961	1,095	0,982	1,010	0,880	1,015	1,011	1,006	0,956	1,012	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2006	0,780	0,862	0,954	1,032	0,896	0,992	1,000	1,000	0,900	1,000	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2007	0,911	1,068	1,001	0,914	1,102	1,090	1,075	1,047	0,964	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2008	0,755	0,932	0,985	1,262	1,008	1,025	0,999	1,000	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2009	1,125	0,974	0,970	0,998	1,031	1,010	0,995	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2010	0,696	0,950	0,912	1,001	0,981	1,000	1,015	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2011	1,120	1,151	0,990	1,263	1,043	1,009	1,015	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2012	1,069	0,864	0,937	0,721	1,022	1,009	1,015	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2013	0,916	1,273	1,078	1,040	1,022	1,009	1,015	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2014	1,190	0,875	1,008	1,040	1,022	1,009	1,015	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2015	1,537	1,029	1,008	1,040	1,022	1,009	1,015	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000
2016	1,111	1,029	1,008	1,040	1,022	1,009	1,015	1,007	0,995	1,007	1,002	0,999	1,002	1,016	1,009	1,006	1,025	1,002	1,012	1,003	1,000	1,000	1,000	1,000

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994																								
1995	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	91,936	91,936	121,424	121,424	121,424	121,424	121,424	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027
1996	53,531,125	48,276,726	49,847,526	49,418,089	52,753,129	55,738,396	57,091,007	58,374,711	57,572,076	56,151,495	56,390,041	56,178,167	57,273,587	58,214,906	59,977,746	60,770,988	61,688,929	63,792,666	65,150,169	65,977,885	66,150,233	66,150,233	66,150,233	66,150,233
1997	3,543,065	5,003,407	5,591,940	6,506,249	7,361,588	7,565,500	7,588,968	7,217,147	6,965,220	7,171,888	7,878,236	7,773,569	7,951,255	8,044,060	8,363,527	8,429,349	8,444,780	8,584,335	8,506,853	8,608,820	8,631,269	8,631,269	8,631,269	8,631,269
1998	7,429,437	8,941,577	12,389,029	13,424,188	13,939,877	14,570,902	14,102,408	14,159,777	14,839,092	15,023,956	15,269,044	16,062,593	16,454,809	16,906,144	17,607,797	17,824,255	17,845,695	18,556,400	18,647,583	18,871,100	18,920,310	18,920,310	18,920,310	18,920,310
1999	5,849,938	8,094,566	8,311,907	7,807,024	8,213,655	7,915,684	7,242,692	7,144,802	7,296,091	7,405,843	7,639,350	7,734,873	8,095,876	8,109,649	8,082,190	8,010,409	7,958,496	8,144,203	8,164,212	8,262,072	8,283,616	8,283,616	8,283,616	8,283,616
2000	9,626,729	10,998,160	12,447,019	12,916,308	12,072,952	11,189,343	11,884,304	12,527,734	13,184,764	13,443,240	13,356,076	13,303,943	13,714,879	13,845,656	14,010,844	14,208,531	14,461,977	14,818,525	14,854,932	15,032,989	15,072,191	15,072,191	15,072,191	15,072,191
2001	3,662,190	3,277,877	3,460,603	2,964,615	2,959,091	2,639,770	2,822,892	3,068,847	3,139,443	3,019,333	3,085,541	3,084,652	3,038,162	2,911,754	2,580,388	2,629,369	2,645,266	2,710,483	2,717,142	2,749,711	2,756,881	2,756,881	2,756,881	2,756,881
2002	2,887,973	3,045,240	2,935,097	2,684,520	2,508,971	2,520,894	2,620,222	2,511,289	2,555,466	3,011,044	3,250,885	3,223,769	3,081,785	3,114,120	3,344,801	3,374,995	3,395,400	3,479,111	3,487,659	3,529,463	3,538,667	3,538,667	3,538,667	3,538,667
2003	1,540,299	1,243,642	1,313,938	1,106,898	1,052,162	1,051,368	1,093,625	1,072,570	1,107,455	1,170,318	1,186,375	1,221,832	1,121,173	1,141,225	1,160,006	1,170,477	1,177,554	1,206,586	1,209,550	1,224,048	1,227,240	1,227,240	1,227,240	1,227,240
2004	2,351,364	1,873,715	1,810,490	1,836,563	1,934,943	1,923,520	1,904,994	1,830,593	1,870,297	1,851,844	1,789,255	1,770,349	1,752,808	1,757,064	1,785,979	1,802,101	1,812,997	1,857,695	1,862,259	1,884,581	1,889,495	1,889,495	1,889,495	1,889,495
2005	3,238,116	3,029,141	2,910,583	3,186,816	3,130,310	3,162,222	2,781,320	2,823,319	2,855,744	2,871,585	2,744,820	2,777,459	2,775,872	2,782,611	2,828,403	2,853,935	2,871,191	2,941,977	2,949,205	2,984,556	2,992,338	2,992,338	2,992,338	2,992,338
2006	850,017	663,381	572,074	545,901	563,397	504,750	500,939	500,939	500,939	450,938	450,938	451,730	451,472	452,568	460,016	464,168	466,975	478,488	479,663	485,413	486,679	486,679	486,679	486,679
2007	1,090,014	993,082	1,060,685	1,062,066	970,948	1,070,209	1,166,127	1,253,301	1,312,571	1,264,959	1,273,956	1,276,194	1,275,465	1,278,561	1,299,602	1,311,334	1,319,262	1,351,787	1,355,109	1,371,351	1,374,928	1,374,928	1,374,928	1,374,928
2008	731,009	551,962	514,640	506,914	639,744	644,925	660,908	660,233	660,233	657,007	661,680	662,842	662,464	664,072	675,000	681,094	685,212	702,105	703,830	712,266	714,124	714,124	714,124	714,124
2009	722,858	813,159	792,29																					



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Selection of Loss Development Factors

RY	Development Period in Months																					
	<u>12 - 24</u>	<u>24 - 36</u>	<u>36 - 48</u>	<u>48 - 60</u>	<u>60 - 72</u>	<u>72 - 84</u>	<u>84 - 96</u>	<u>96 - 108</u>	<u>108 - 120</u>	<u>120 - 132</u>	<u>132 - 144</u>	<u>144 - 156</u>	<u>156 - 168</u>	<u>168 - 180</u>	<u>180 - 192</u>	<u>192 - 204</u>	<u>204 - 216</u>	<u>216 - 228</u>	<u>228 - 240</u>	<u>240 - 252</u>	<u>252 - 264</u>	<u>264 - 276</u>
1994																						
1995	1.000	1.000	1.000	1.000	1.000	1.000	1.000	3.677	1.000	1.321	1.000	1.000	1.000	1.000	0.939	1.000	1.000	1.000	1.000	1.000	1.000	
1996	0.902	1.033	0.991	1.067	1.057	1.024	1.022	0.986	0.975	1.004	0.996	1.019	1.016	1.030	1.013	1.015	1.034	1.021	1.013	1.003		
1997	1.412	1.118	1.164	1.131	1.028	1.003	0.951	0.965	1.030	1.098	0.987	1.023	1.012	1.040	1.008	1.002	1.017	0.991	1.012			
1998	1.204	1.386	1.084	1.038	1.045	0.968	1.004	1.048	1.012	1.016	1.052	1.024	1.027	1.042	1.012	1.001	1.040	1.005				
1999	1.384	1.027	0.939	1.052	0.964	0.915	0.986	1.021	1.015	1.032	1.011	1.048	1.002	0.997	0.991	0.994	1.023					
2000	1.142	1.132	1.038	0.935	0.927	1.062	1.054	1.052	1.020	0.994	0.996	1.031	1.010	1.012	1.014	1.018						
2001	0.896	1.055	0.857	0.998	0.892	1.069	1.087	1.023	0.962	1.022	1.000	0.985	0.958	0.886	1.019							
2002	1.054	0.964	0.915	0.935	1.005	1.039	0.958	1.018	1.178	1.080	0.992	0.956	1.010	1.074								
2003	0.807	1.057	0.842	0.951	0.999	1.040	0.981	1.033	1.057	1.014	1.030	0.918	1.018									
2004	0.797	0.966	1.014	1.054	0.994	0.990	0.961	1.022	0.990	0.966	0.989	0.990										
2005	0.935	0.961	1.095	0.982	1.010	0.880	1.015	1.011	1.006	0.956	1.012											
2006	0.780	0.862	0.954	1.032	0.896	0.992	1.000	1.000	0.900	1.000												
2007	0.911	1.068	1.001	0.914	1.102	1.090	1.075	1.047	0.964													
2008	0.755	0.932	0.985	1.262	1.008	1.025	0.999	1.000														
2009	1.125	0.974	0.970	0.998	1.031	1.010	0.995															
2010	0.696	0.950	0.912	1.001	0.981	1.000																
2011	1.120	1.151	0.990	1.263	1.043																	
2012	1.069	0.864	0.937																			
2013	0.916	1.273	1.078																			
2014	1.190	0.875																				
2015	1.537																					
VOL WTD 3	1.120	1.000	1.008	1.080	1.023	1.010	1.031	1.025	0.982	0.963	1.009	0.958	0.990	1.003	1.007	1.006	1.030	1.015	1.013	1.003	1.000	NA
VOL WTD 5	1.111	1.029	0.980	1.087	1.037	1.030	1.021	1.019	0.995	1.007	1.002	1.005	1.002	1.016	1.009	1.011	1.033	1.015	1.013	1.003	1.000	NA
VOL WTD ALL	0.997	1.072	1.007	1.040	1.022	1.009	1.015	1.007	0.997	1.013	1.005	1.019	1.014	1.025	1.011	1.011	1.033	1.015	1.013	1.003	1.000	NA
ARITH 3	1.214	1.004	1.002	0.995	1.018	1.012	1.023	1.016	0.956	0.974	1.010	0.955	0.996	0.991	1.008	1.004	1.027	1.006	1.008	1.001	1.000	NA
ARITH 5	1.166	1.023	0.977	1.049	1.033	1.023	1.017	1.016	0.983	1.003	1.005	0.976	1.000	1.002	1.009	1.006	1.023	1.004	1.008	1.001	1.000	NA
ARITH ALL	1.030	1.032	0.988	1.019	0.999	1.007	1.006	1.207	1.008	1.042	1.006	0.999	1.006	1.010	1.000	1.005	1.023	1.004	1.008	1.001	1.000	NA
5 YR HI LO	1.126	0.992	0.966	1.087	1.027	1.012	1.005	1.011	0.986	0.993	1.001	0.977	1.007	1.017	1.011	1.006	1.025	1.002	1.012	NA	NA	NA
SELECTED	1.111	1.029	1.008	1.040	1.022	1.009	1.015	1.007	0.995	1.007	1.002	0.999	1.002	1.016	1.009	1.006	1.025	1.002	1.012	1.003	1.000	1.000
																						TAIL
																						1.000

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Incurred Losses

	Development in Months																						
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	91,936	91,936	121,424	121,424	121,424	121,424	121,424	114,027	114,027	114,027	114,027	114,027	114,027	114,027	114,027
1996	53,531,125	48,276,726	49,847,526	49,418,089	52,753,129	55,738,396	57,091,007	58,374,711	57,572,076	56,151,495	56,390,041	56,178,167	57,273,587	58,214,906	59,977,746	60,770,988	61,688,929	63,792,666	65,150,169	65,977,885	66,150,233	66,150,233	66,150,233
1997	3,543,065	5,003,407	5,591,940	6,506,249	7,361,588	7,565,500	7,588,968	7,217,147	6,965,220	7,171,888	7,878,236	7,773,569	7,951,255	8,044,060	8,363,527	8,429,349	8,444,780	8,584,335	8,506,853	8,608,820	8,608,820	8,608,820	8,608,820
1998	7,429,437	8,941,577	12,389,029	13,424,188	13,939,877	14,570,902	14,102,048	14,159,777	14,839,092	15,023,956	15,269,044	16,062,593	16,454,809	16,906,144	17,607,797	17,824,255	17,845,695	18,556,400	18,647,583	18,647,583	18,647,583	18,647,583	18,647,583
1999	5,849,938	8,094,566	8,311,907	7,807,024	8,213,655	7,915,684	7,242,692	7,144,802	7,296,091	7,405,843	7,639,350	7,724,873	8,095,876	8,109,649	8,082,190	8,010,409	7,958,496	8,144,203	8,144,203	8,144,203	8,144,203	8,144,203	8,144,203
2000	9,626,729	10,998,160	12,447,019	12,916,308	12,072,952	11,189,343	11,884,304	12,527,734	13,184,764	13,443,240	13,356,076	13,303,943	13,714,879	13,845,656	14,010,844	14,208,531	14,461,977	14,461,977	14,461,977	14,461,977	14,461,977	14,461,977	14,461,977
2001	3,662,190	3,279,877	3,460,603	2,964,615	2,959,091	2,639,770	2,822,892	3,068,847	3,139,443	3,019,333	3,085,541	3,084,652	3,038,162	2,911,754	2,580,388	2,629,369	2,629,369	2,629,369	2,629,369	2,629,369	2,629,369	2,629,369	2,629,369
2002	2,887,973	3,045,240	2,935,097	2,684,520	2,508,971	2,520,894	2,620,222	2,511,289	2,555,466	3,011,044	3,250,885	3,223,769	3,081,785	3,114,120	3,344,801	3,344,801	3,344,801	3,344,801	3,344,801	3,344,801	3,344,801	3,344,801	3,344,801
2003	1,540,299	1,243,642	1,313,938	1,106,898	1,052,162	1,051,368	1,093,625	1,072,570	1,107,455	1,170,318	1,186,375	1,221,832	1,121,173	1,141,225	1,141,225	1,141,225	1,141,225	1,141,225	1,141,225	1,141,225	1,141,225	1,141,225	1,141,225
2004	2,351,364	1,873,715	1,810,490	1,836,563	1,934,943	1,923,520	1,904,994	1,830,593	1,870,297	1,851,844	1,789,255	1,770,349	1,752,808	1,752,808	1,752,808	1,752,808	1,752,808	1,752,808	1,752,808	1,752,808	1,752,808	1,752,808	1,752,808
2005	3,238,116	3,029,141	2,910,583	3,186,816	3,130,310	3,162,222	2,781,320	2,823,319	2,855,744	2,871,585	2,744,820	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459	2,777,459
2006	850,017	663,381	572,074	545,901	563,397	504,750	500,939	500,939	500,939	500,939	450,938	450,938	450,938	450,938	450,938	450,938	450,938	450,938	450,938	450,938	450,938	450,938	450,938
2007	1,090,014	993,082	1,060,685	1,062,066	970,948	1,070,209	1,166,127	1,253,301	1,312,571	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959	1,264,959
2008	731,009	551,962	514,640	506,914	639,744	644,925	660,908	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233	660,233
2009	722,858	813,159	792,223	768,527	767,284	790,727	798,503	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122	794,122
2010	1,501,515	1,045,356	993,470	905,640	906,778	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689	889,689
2011	1,049,033	1,175,046	1,352,536	1,338,970	1,691,617	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581	1,763,581
2012	560,806	599,281	517,535	484,868	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610	349,610
2013	749,010	686,060	873,521	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049	942,049
2014	704,012	837,531	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853	732,853
2015	247,006	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643	379,643
2016	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008	505,008

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial UST  
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>POTENTIAL</u> <u>SITES</u>	<u>PURE</u> <u>PREMIUM</u>
2008	1,061,649	714,124	887,886	12,021	74
2009	1,168,376	864,870	1,016,623	12,004	85
2010	889,689	983,456	936,573	11,974	78
2011	1,763,581	1,966,308	1,864,945	11,937	156
2012	569,083	398,451	483,767	11,916	41
2013	1,414,558	1,117,125	1,265,841	11,888	106
2014	1,388,952	876,113	1,132,533	11,855	96
2015	379,643	467,090	423,367	11,836	36
2016	505,008	690,356	597,682	11,816	51
TOTAL	9,140,540	8,077,893	8,609,216	107,247	80

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
UST Remedial Claims  
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
RY	POTENTIAL SITES	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM	
2008	12,021	74	41	108	1,298,308	44.7%	579,985	587,385	1,167,370	660,233	507,137	72,848	97	
2009	12,004	85	51	100	1,205,719	47.6%	573,564	612,576	1,186,140	794,122	392,018	181,546	99	
2010	11,974	78	51	93	1,118,516	50.0%	559,725	378,531	938,256	889,689	48,567	511,159	78	
2011	11,937	156	109	87	1,037,006	53.4%	554,243	813,135	1,367,378	1,763,581	(396,203)	950,446	115	
2012	11,916	41	30	81	962,719	58.7%	565,011	235,093	800,104	349,610	450,494	114,517	67	
2013	11,888	106	86	75	893,225	63.9%	571,145	510,062	1,081,207	942,049	139,158	431,987	91	
2014	11,855	96	83	70	828,393	69.7%	577,675	420,375	998,050	732,853	265,197	312,478	84	
2015	11,836	36	33	65	769,171	82.0%	630,956	37,773	668,729	379,643	289,086	341,871	56	
2016	11,816	51	51	60	714,120	96.5%	688,943	-	688,943	505,008	183,935	505,008	58	
TOTAL	107,247				8,827,176		5,301,247	3,594,930	8,896,177	7,016,788	1,879,388	3,421,858	83	
	<u>Pure Premium Selection</u>				Trend =	0.930								
	3-Year Average x Latest			67										
	5-Year Average x Latest			68										
	All Year Average x Latest			60										
	Selected Pure Premium			60										

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
UST Remedial Claims  
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POTENTIAL SITES	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT IBNR	EXPECTED IBNR	INCURRED LOSSES	INDICATED ULTIMATE	PAID LOSSES	UNPAID LOSS	CASE RESERVE	ULTIMATE PURE PREM
2008	12,021	74	41	108	1,298,308	7.5%	97,976	660,233	758,209	587,385	170,824	72,848	63
2009	12,004	85	51	100	1,205,719	8.2%	98,630	794,122	892,752	612,576	280,176	181,546	74
2010	11,974	78	51	93	1,118,516	9.5%	106,644	889,689	996,333	378,531	617,802	511,159	83
2011	11,937	156	109	87	1,037,006	10.3%	106,916	1,763,581	1,870,497	813,135	1,057,362	950,446	157
2012	11,916	41	30	81	962,719	12.3%	118,009	349,610	467,618	235,093	232,525	114,517	39
2013	11,888	106	86	75	893,225	15.7%	139,986	942,049	1,082,035	510,062	571,973	431,987	91
2014	11,855	96	83	70	828,393	16.4%	135,457	732,853	868,310	420,375	447,935	312,478	73
2015	11,836	36	33	65	769,171	18.7%	144,002	379,643	523,645	37,773	485,872	341,871	44
2016	11,816	51	51	60	714,120	26.8%	191,728	505,008	696,736	-	696,736	505,008	59
TOTAL	107,247				8,827,176		1,139,347	7,016,788	8,156,135	3,594,930	4,561,205	3,421,858	76
	<u>Pure Premium Selection</u>				Trend =	0.930							
	3-Year Average x Latest		67										
	5-Year Average x Latest		68										
	All Year Average x Latest		60										
	Selected Pure Premium		60										

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Summary of Paid Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	515,687	478,042	478,042	478,042	-	-
1999	2,767,896	2,767,896	2,529,597	2,689,230	159,632	78,666
2000	1,330,523	1,195,793	1,195,793	1,195,793	-	-
2001	6,228,433	6,318,643	5,488,608	6,318,643	830,035	-
2002	1,902,701	2,234,838	1,638,304	2,234,838	596,534	-
2003	1,370,649	1,501,010	1,145,541	1,501,010	355,469	-
2004	3,166,613	3,166,613	2,565,442	2,884,520	319,078	282,093
2005	1,817,644	1,817,644	1,431,885	1,672,486	240,601	145,157
2006	2,213,322	2,213,322	1,534,980	2,018,289	483,309	195,034
2007	1,690,784	1,690,784	1,108,422	1,192,870	84,448	497,915
2008	841,626	841,626	516,229	616,446	100,217	225,180
2009	993,889	993,889	569,158	849,952	280,794	143,937
2010	604,667	604,667	327,938	587,710	259,772	16,957
2011	1,392,082	1,392,082	711,550	881,631	170,081	510,450
2012	3,316,313	3,316,313	1,533,202	2,153,132	619,930	1,163,181
2013	1,848,839	1,848,839	753,022	1,149,154	396,132	699,686
2014	59,605	783,406	19,091	783,406	764,315	-
2015	712,583	712,583	172,789	702,914	530,125	9,669
2016	1,521,747	1,521,747	145,829	702,006	556,177	819,741
TOTAL	34,295,604	35,399,737	23,865,421	30,612,069	6,746,648	4,787,668

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Development of Losses to Ultimate

RY	Development Period in Months																276 - ULT						
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	
1994																							1.038
1995																						1.007	1.038
1996																				1.010	1.009	1.007	1.038
1997																				1.010	1.009	1.007	1.038
1998		1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.669	2.231	2.058	1.148	1.066	1.091	1.000	1.000	1.000	1.000	1.012	1.010	1.009	1.007	1.038
1999	15.900	1.244	2.319	1.021	1.004	1.011	1.041	1.014	1.085	1.078	1.058	1.037	1.005	1.016	1.000	1.124	1.000	1.014	1.012	1.010	1.009	1.007	1.038
2000	1.761	1.262	1.034	1.014	1.018	1.108	1.028	1.038	1.083	1.014	1.013	1.025	1.001	1.010	1.000	1.000	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2001	1.541	1.087	1.075	1.093	1.050	1.021	1.028	1.099	1.106	1.029	1.266	1.019	1.043	1.029	1.094	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2002	10.706	2.111	1.228	1.161	1.078	1.049	1.133	1.134	1.168	1.037	1.019	1.010	1.052	1.053	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2003	3.306	1.453	1.561	1.192	1.187	1.137	1.043	1.129	1.051	1.067	1.192	1.050	1.041	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2004	3.116	1.474	1.254	1.298	1.343	1.122	1.032	1.102	1.122	1.044	1.055	1.050	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2005	11.692	1.138	1.099	1.080	1.052	1.048	1.018	1.026	1.008	1.008	1.017	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2006	4.502	1.556	1.611	1.283	1.183	1.035	1.111	1.026	1.092	1.151	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2007	3.306	1.594	1.127	1.341	1.099	1.033	1.053	1.050	1.036	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2008	2.474	1.276	1.351	1.168	1.027	1.067	1.100	1.125	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2009	10.467	1.861	1.934	1.065	1.456	1.254	1.238	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2010	4.034	1.182	1.691	1.078	1.324	1.134	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2011	3.325	1.526	1.081	1.124	1.092	1.061	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2012	1.608	1.402	1.175	1.175	1.106	1.061	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2013	3.828	1.585	1.391	1.135	1.106	1.061	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2014	1.000	6.122	1.272	1.135	1.106	1.061	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2015	4.922	1.321	1.272	1.135	1.106	1.061	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038
2016	2.530	1.321	1.272	1.135	1.106	1.061	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007	1.038

RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	16,713	16,713	16,713	16,713	16,713	16,713	16,713	16,713	78,028	174,102	358,349	411,237	438,258	478,042	478,042	478,042	478,042	478,042	483,857	488,855	493,144	496,820	515,687
1999	34,176	543,408	676,196	1,567,972	1,601,529	1,608,182	1,625,584	1,692,876	1,717,189	1,863,780	2,008,295	2,125,717	2,204,155	2,214,424	2,250,269	2,250,269	2,529,597	2,529,597	2,565,837	2,597,049	2,623,877	2,646,899	2,666,626	2,767,896
2000	370,129	651,957	822,756	850,390	862,198	877,375	971,906	999,462	1,037,135	1,123,070	1,139,298	1,154,165	1,182,661	1,184,428	1,195,793	1,195,793	1,195,793	1,215,973	1,233,394	1,248,397	1,261,293	1,272,360	1,281,843	1,330,523
2001	1,334,769	2,056,418	2,236,336	2,404,395	2,628,060	2,759,085	2,817,023	2,896,871	3,185,541	3,519,996	3,623,500	4,589,112	4,674,733	4,876,595	5,018,242	5,488,608	5,597,739	5,692,204	5,773,753	5,843,986	5,904,357	5,956,161	6,000,553	6,228,433
2002	25,391	271,845	573,933	704,799	818,350	881,841	924,693	1,047,264	1,187,136	1,386,044	1,436,815	1,464,223	1,479,159	1,556,347	1,638,304	1,676,694	1,710,032	1,738,890	1,763,802	1,785,258	1,803,700	1,819,525	1,833,086	1,902,701
2003	55,198	182,491	265,162	413,872	493,384	585,783	665,773	694,461	783,706	823,855	878,721	1,047,401	1,100,227	1,145,541	1,180,186	1,207,841	1,231,857	1,252,645	1,270,591	1,286,047	1,299,332	1,310,732	1,320,501	1,370,649
2004	154,438	481,188	709,451	889,323	1,154,237	1,550,136	1,738,876	1,795,147	1,978,584	2,219,493	2,316,258	2,443,349	2,565,442	2,646,545	2,726,585	2,790,476	2,845,960	2,893,987	2,935,447	2,971,155	3,001,848	3,028,186	3,050,755	3,166,613
2005	76,161	890,444	1,013,676	1,114,425	1,203,629	1,266,271	1,326,703	1,350,155	1,385,185	1,396,276	1,407,470	1,431,885	1,472,570	1,519,124	1,565,066	1,601,740	1,633,588	1,661,156	1,684,954	1,705,450	1,723,068	1,738,186	1,751,141	1,817,644
2006	60,491	272,313	423,641	682,375	875,535	1,035,779	1,072,081	1,190,682	1,221,925	1,334,084	1,534,980	1,743,589	1,793,130	1,849,818	1,905,762	1,950,419	1,989,200	2,022,769	2,051,748	2,076,706	2,098,159	2,116,568	2,132,343	2,213,322
2007	107,082	353,965	564,316	635,862	852,470	936,817	967,505	1,018,844	1,069,756	1,108,422	1,172,590	1,331,949	1,369,794	1,413,099	1,455,835	1,489,949	1,519,574	1,545,218	1,567,356	1,586,421	1,602,810	1,616,873	1,628,923	1,690,784
2008	76,453	189,175	241,331	325,929	380,673	391,046	417,098	458,918	516,229	551,742	583,683	663,008	681,846	703,402	724,675	741,656	756,402	769,167	780,186	789,677	797,835	804,835	810,833	841,626
2009	6,274	65,671	122,193	236,292	251,768	366,562	459,776	569,158	609,622	651,560	689,280	782,956	805,202	830,658	855,779	875,833	893,247	908,321	921,334	932,542	942,175	950,442	957,525	993,889
2010	25,118	101,329	119,772	202,531	218,274	289,061	327,938	346,267	370,885	396,400	419,348	476,339	489,873	505,360	520,644	532,844	543,438	552,609	560,526	567,345	573,205	578,235	582,544	604,667
2011	105,665	351,316	535,992	579,582	651,347	711,550	754,987	797,186	853,862	912,602	965,434	1,096,640	1,127,799	1,163,454	1,198,640	1,226,727	1,251,119	1,272,232	1,290,459	1,306,156	1,319,649	1,331,228	1,341,149	1,392,082
2012	492,662	792,235	1,110,684	1,305,178	1,533,202	1,695,104	1,798,583	1,899,112	2,034,128	2,174,063	2,299,924	2,612,492	2,686,721	2,771,659	2,855,482	2,922,394	2,980,501	3,030,799	3,074,219	3,111,615	3,143,759	3,171,342	3,194,978	3,316,313
2013	89,198	341,477	541,380	753,022	854,758	945,018	1,002,707	1,058,752	1,134,024	1,212,037	1,282,204	1,456,461	1,497,843	1,545,196	1,591,927	1,629,231	1,661,625	1,689,666	1,713,873	1,734,721	1,752,641	1,768,018	1,781,196	1,848,839
2014	3,119	3,119	19,091	24,277	27,557	30,467	32,326	34,133	36,560	39,075	41,337	46,955	48,289	49,816	51,322	52,525	53,569	54,473	55,254	56,504	56,999	57,424	59,605	
2015	35,104	172,789	228,235	290,231	329,442	364,230	386,465	408,066	437,077	467,145	494,189	561,352	577,301	595,552	613,563	627,941	640,426	651,234	660,564	668,599	675,506	681,433	686,511	712,583
2016	145,829	368,997	487,405	619,799	703,536	777,828	825,311	871,440	933,395	997,607	1,055,360	1,198,787	1,232,849	1,271,824										

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Selection of Loss Development Factors

RY	Development Period in Months																					
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276
1994																						
1995																						
1996																						
1997																						
1998		1.000	1.000	1.000	1.000	1.000	1.000	1.000	4.669	2.231	2.058	1.148	1.066	1.091	1.000	1.000	1.000	1.000				
1999	15.900	1.244	2.319	1.021	1.004	1.011	1.041	1.014	1.085	1.078	1.058	1.037	1.005	1.016	1.000	1.124	1.000					
2000	1.761	1.262	1.034	1.014	1.018	1.108	1.028	1.038	1.083	1.014	1.013	1.025	1.001	1.010	1.000	1.000						
2001	1.541	1.087	1.075	1.093	1.050	1.021	1.028	1.099	1.106	1.029	1.266	1.019	1.043	1.029	1.094							
2002	10.706	2.111	1.228	1.161	1.078	1.049	1.133	1.134	1.168	1.037	1.019	1.010	1.052	1.053								
2003	3.306	1.453	1.561	1.192	1.187	1.137	1.043	1.129	1.051	1.067	1.192	1.050	1.041									
2004	3.116	1.474	1.254	1.298	1.343	1.122	1.032	1.102	1.122	1.044	1.055	1.050										
2005	11.692	1.138	1.099	1.080	1.052	1.048	1.018	1.026	1.008	1.008	1.017											
2006	4.502	1.556	1.611	1.283	1.183	1.035	1.111	1.026	1.092	1.151												
2007	3.306	1.594	1.127	1.341	1.099	1.033	1.053	1.050	1.036													
2008	2.474	1.276	1.351	1.168	1.027	1.067	1.100	1.125														
2009	10.467	1.861	1.934	1.065	1.456	1.254	1.238															
2010	4.034	1.182	1.691	1.078	1.324	1.134																
2011	3.325	1.526	1.081	1.124	1.092																	
2012	1.608	1.402		1.175																		
2013	3.828	1.585	1.391																			
2014	1.000	6.122																				
2015	4.922																					
VOL WTD 3	4.060	1.470	1.206	1.151	1.219	1.151	1.110	1.052	1.044	1.062	1.070	1.038	1.045	1.031	1.056	1.071	1.000	1.000	NA	NA	NA	NA
VOL WTD 5	2.289	1.464	1.266	1.146	1.145	1.075	1.081	1.062	1.069	1.058	1.136	1.028	1.032	1.030	1.053	1.071	1.000	1.000	NA	NA	NA	NA
VOL WTD ALL	2.530	1.321	1.272	1.135	1.106	1.061	1.056	1.071	1.094	1.056	1.126	1.033	1.033	1.030	1.053	1.071	1.000	1.000	NA	NA	NA	NA
ARITH 3	3.250	3.036	1.216	1.125	1.291	1.152	1.130	1.067	1.045	1.067	1.088	1.037	1.046	1.030	1.031	1.041	1.000	1.000	NA	NA	NA	NA
ARITH 5	2.937	2.363	1.454	1.122	1.200	1.105	1.104	1.066	1.062	1.061	1.110	1.031	1.029	1.040	1.023	1.041	1.000	1.000	NA	NA	NA	NA
ARITH ALL	5.146	1.698	1.371	1.140	1.137	1.078	1.069	1.067	1.442	1.184	1.210	1.048	1.035	1.040	1.023	1.041	1.000	1.000	NA	NA	NA	NA
5 YR HI LO	2.920	1.504	1.419	1.123	1.172	1.079	1.088	1.059	1.060	1.049	1.089	1.031	1.030	1.033	1.000	1.000	NA	NA	NA	NA	NA	TAIL
SELECTED	2.530	1.321	1.272	1.135	1.106	1.061	1.056	1.071	1.069	1.058	1.136	1.028	1.032	1.030	1.023	1.020	1.017	1.014	1.012	1.010	1.009	1.007



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Paid Losses

RY	Development in Months																204	216	228	240	252	264	276
	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192							
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	16,713	16,713	16,713	16,713	16,713	16,713	16,713	16,713	78,028	174,102	358,349	411,237	438,258	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042
1999	34,176	543,408	676,196	1,567,972	1,601,529	1,608,182	1,625,584	1,692,876	1,717,189	1,863,780	2,008,295	2,125,717	2,204,155	2,214,424	2,250,269	2,250,269	2,529,597	2,529,597	2,529,597	2,529,597	2,529,597	2,529,597	2,529,597
2000	370,129	651,957	822,756	850,390	862,198	877,375	971,906	999,462	1,037,135	1,123,070	1,139,298	1,154,165	1,182,661	1,184,428	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793
2001	1,334,769	2,056,418	2,236,336	2,404,395	2,628,060	2,759,085	2,817,023	2,896,871	3,183,541	3,519,996	3,623,500	4,589,112	4,674,733	4,876,595	5,018,242	5,488,608	5,488,608	5,488,608	5,488,608	5,488,608	5,488,608	5,488,608	5,488,608
2002	25,391	271,845	573,933	704,799	818,350	881,841	924,693	1,047,264	1,187,136	1,386,044	1,436,815	1,464,223	1,479,159	1,556,347	1,638,304	1,638,304	1,638,304	1,638,304	1,638,304	1,638,304	1,638,304	1,638,304	1,638,304
2003	55,198	182,491	265,162	413,872	493,384	585,783	665,773	694,461	783,706	823,855	878,721	1,047,401	1,100,227	1,145,541	1,145,541	1,145,541	1,145,541	1,145,541	1,145,541	1,145,541	1,145,541	1,145,541	1,145,541
2004	154,438	481,188	709,451	889,323	1,154,237	1,550,136	1,738,876	1,795,147	1,978,584	2,219,493	2,316,258	2,443,349	2,565,442	2,565,442	2,565,442	2,565,442	2,565,442	2,565,442	2,565,442	2,565,442	2,565,442	2,565,442	2,565,442
2005	76,161	890,444	1,013,676	1,114,425	1,203,629	1,266,271	1,326,703	1,350,155	1,385,185	1,396,276	1,407,470	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885	1,431,885
2006	60,491	272,313	423,641	682,375	875,535	1,035,779	1,072,081	1,190,682	1,221,925	1,334,084	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980	1,534,980
2007	107,082	353,965	564,316	635,862	852,470	936,817	967,505	1,018,844	1,069,756	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422	1,108,422
2008	76,453	189,175	241,331	325,929	380,673	391,046	417,098	458,918	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229	516,229
2009	6,274	65,671	122,193	236,292	251,768	366,562	459,776	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158	569,158
2010	25,118	101,329	119,772	202,531	218,274	289,061	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938	327,938
2011	105,665	351,316	535,992	579,582	651,347	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550	711,550
2012	492,662	792,235	1,110,684	1,305,178	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202	1,533,202
2013	89,198	341,477	541,380	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022	753,022
2014	3,119	3,119	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091	19,091
2015	35,104	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789	172,789
2016	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829	145,829

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>RY</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>PAID</u> <u>LOSS</u>	<u>INCURRED</u> <u>LOSS</u>	<u>CASE</u> <u>RESERVE</u>	<u>IBNR</u> <u>RESERVE</u>	<u>UNPAID</u> <u>LOSS</u>
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	478,042	478,042	478,042	-	-	-
1999	2,689,230	2,529,597	2,689,230	159,632	-	159,632
2000	1,195,793	1,195,793	1,195,793	-	-	-
2001	6,318,643	5,488,608	6,318,643	830,035	-	830,035
2002	2,234,838	1,638,304	2,234,838	596,534	-	596,534
2003	1,513,116	1,145,541	1,501,010	355,469	12,106	367,575
2004	2,861,780	2,565,442	2,884,520	319,078	(22,739)	296,339
2005	1,672,674	1,431,885	1,672,486	240,601	188	240,789
2006	2,014,231	1,534,980	2,018,289	483,309	(4,057)	479,252
2007	1,216,178	1,108,422	1,192,870	84,448	23,308	107,756
2008	621,668	516,229	616,446	100,217	5,222	105,439
2009	966,086	569,158	849,952	280,794	116,134	396,928
2010	676,398	327,938	587,710	259,772	88,688	348,460
2011	1,053,835	711,550	881,631	170,081	172,203	342,284
2012	2,694,077	1,533,202	2,153,132	619,930	540,945	1,160,876
2013	1,489,084	753,022	1,149,154	396,132	339,931	736,062
2014	1,003,910	19,091	783,406	764,315	220,504	984,819
2015	986,443	172,789	702,914	530,125	283,529	813,654
2016	1,190,215	145,829	702,006	556,177	488,209	1,044,386
TOTAL	32,876,241	23,865,421	30,612,069	6,746,648	2,264,172	9,010,820

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Development of Losses to Ultimate

RY	Development Period in Months																			276 - ULT				
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276		
1994																							1,000	
1995																						1,000	1,000	
1996																						1,000	1,000	
1997																				1,000	1,000	1,000	1,000	
1998	0.919	1.000	1.000	1.000	1.000	1.000	1.000	1.000	5.060	1.000	1.000	1.000	0.941	0.860	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
1999	2.823	1.728	1.311	1.028	1.000	1.002	1.000	1.223	1.011	1.020	1.017	0.999	0.985	1.000	1.000	1.050	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2000	0.962	1.129	1.031	0.939	0.956	1.047	1.016	1.044	1.052	1.000	1.000	0.998	1.001	0.993	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2001	1.249	1.030	0.860	0.957	1.024	1.053	1.037	1.158	1.088	1.010	1.145	1.020	1.010	1.065	1.015	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2002	1.400	0.975	0.747	0.999	1.094	1.051	0.969	1.000	0.961	1.006	1.000	1.208	0.910	1.031	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2003	0.917	0.827	1.143	1.042	1.096	1.030	1.030	1.011	1.061	1.240	0.987	1.006	0.967	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2004	1.017	1.163	1.104	1.448	1.013	1.039	1.007	1.279	1.013	0.998	0.994	0.994	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2005	0.924	1.035	1.032	0.955	1.137	1.010	1.011	0.988	1.000	1.002	1.000	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2006	1.741	1.117	1.068	1.045	1.040	1.074	1.037	1.282	0.879	1.057	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2007	0.951	0.996	0.948	0.974	1.000	1.099	1.009	0.999	0.954	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2008	1.200	1.023	0.966	1.026	1.127	1.000	1.000	1.083	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2009	1.279	1.001	1.295	1.058	1.133	1.003	1.000	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2010	0.567	1.112	1.246	1.147	1.203	1.000	1.013	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2011	1.092	1.390	0.942	0.989	1.006	1.039	1.013	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2012	1.147	1.410	0.953	1.053	1.047	1.039	1.013	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2013	1.060	1.007	1.066	1.036	1.047	1.039	1.013	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2014	6.773	0.940	0.989	1.036	1.047	1.039	1.013	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2015	1.693	1.095	0.989	1.036	1.047	1.039	1.013	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2016	1.208	1.095	0.989	1.036	1.047	1.039	1.013	1.127	0.989	1.022	0.998	1.008	0.984	1.008	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	127,001	116,714	116,714	116,714	116,714	116,714	116,714	116,714	116,714	590,611	590,611	590,611	590,611	555,611	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042	478,042
1999	308,314	870,343	1,504,209	1,971,983	2,027,001	2,026,436	2,030,044	2,030,044	2,482,580	2,510,580	2,561,027	2,603,820	2,601,196	2,561,795	2,561,795	2,561,795	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230	2,689,230
2000	1,026,004	986,880	1,114,568	1,148,569	1,078,568	1,030,942	1,079,607	1,097,363	1,145,515	1,205,440	1,205,440	1,205,440	1,202,646	1,203,928	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793	1,195,793
2001	3,289,000	4,108,645	4,233,509	3,642,391	3,484,058	3,566,802	3,756,792	3,895,867	4,511,171	4,910,015	4,958,003	5,677,351	5,790,979	5,849,503	6,227,944	6,318,643	6,318,643	6,318,643	6,318,643	6,318,643	6,318,643	6,318,643	6,318,643	6,318,643
2002	1,797,008	2,516,405	2,453,720	1,833,500	1,832,500	2,004,966	2,106,298	2,041,647	2,041,647	1,961,513	1,972,533	1,972,533	2,381,937	2,167,740	2,234,838	2,234,838	2,234,838	2,234,838	2,234,838	2,234,838	2,234,838	2,234,838	2,234,838	2,234,838
2003	1,120,100	1,027,589	849,418	970,556	1,011,191	1,108,245	1,141,783	1,175,610	1,188,633	1,261,406	1,563,735	1,542,848	1,552,847	1,501,010	1,513,116	1,513,116	1,513,116	1,513,116	1,513,116	1,513,116	1,513,116	1,513,116	1,513,116	1,513,116
2004	1,125,017	1,144,322	1,331,067	1,470,142	2,128,424	2,155,771	2,240,562	2,256,189	2,886,714	2,924,415	2,919,415	2,900,827	2,884,520	2,838,884	2,861,780	2,861,780	2,861,780	2,861,780	2,861,780	2,861,780	2,861,780	2,861,780	2,861,780	2,861,780
2005	1,543,485	1,425,516	1,475,649	1,522,726	1,454,148	1,653,994	1,671,234	1,688,897	1,668,486	1,668,486	1,672,486	1,672,486	1,685,965	1,659,292	1,672,674	1,672,674	1,672,674	1,672,674	1,672,674	1,672,674	1,672,674	1,672,674	1,672,674	1,672,674
2006	674,273	1,174,072	1,310,933	1,399,553	1,462,786	1,521,109	1,634,236	1,694,721	2,173,374	1,909,874	2,018,289	2,014,005	2,030,236	1,998,116	2,014,231	2,014,231	2,014,231	2,014,231	2,014,231	2,014,231	2,014,231	2,014,231	2,014,231	2,014,231
2007	1,288,241	1,225,463	1,220,733	1,156,901	1,127,089	1,127,090	1,238,935	1,250,577	1,249,903	1,192,870	1,218,628	1,216,041	1,225,841	1,206,448	1,216,178	1,216,178	1,216,178	1,216,178	1,216,178	1,216,178	1,216,178	1,216,178	1,216,178	1,216,178
2008	415,004	497,948	509,298	492,059	504,948	569,232	569,232	569,232	616,446	609,753	622,920	621,598	626,607	616,694	621,668	621,668	621,668	621,668	621,668	621,668	621,668	621,668	621,668	621,668
2009	426,280	545,273	545,773	706,544	747,814	847,182	849,952	849,952	957,971	947,571	968,032	965,977	973,762	958,357	966,086	966,086	966,086	966,086	966,086	966,086	966,086	966,086	966,086	966,086
2010	542,005	307,495	341,816	426,049	488,528	587,710	587,710	595,088	670,717	663,435	677,761	676,322	681,773	670,987	676,398	676,398	676,398	676,398	676,398	676,398	676,398	676,398	676,398	676,398
2011	620,289	677,051	941,165	886,346	876,176	881,631	915,657	927,152	1,044,983	1,033,638	1,055,957	1,053,716	1,062,208	1,045,403	1,053,835	1,053,835	1,053,835	1,053,835	1,053,835	1,053,835	1,053,835	1,053,835	1,053,835	1,053,835
2012	1,325,875	1,520,925	2,145,183	2,044,128	2,153,132	2,253,848	2,340,834	2,370,219	2,671,448	2,642,445	2,699,504	2,693,775	2,715,484	2,672,523	2,694,077	2,694,077	2,694,077	2,694,077	2,694,077	2,694,077	2,694,077	2,694,077	2,694,077	2,694,077
2013	1,010,011	1,070,292	1,077,876	1,149,154	1,190,090	1,245,758	1,293,838	1,310,080	1,476,576	1,460,545	1,492,084	1,488,917	1,500,916	1,477,170	1,489,084	1,489,084	1,489,084	1,489,084	1,489,084	1,489,084	1,489,084	1,489,084	1,489,084	1,489,084
2014	123,002	833,119	783,406	774,736	802,334	839,864	872,279	883,229	995,477	984,669	1,005,932	1,003,797	1,011,887	995,878	1,003,910	1,003,910	1,003,910	1,003,910	1,003,910	1,003,910	1,003,910	1,003,910	1,003,910	1,003,910
2015	415,146	702,914	769,776	761,256	788,374	825,252	857,102	867,861	978,157	967,537	988,430	986,332	994,281	978,551	986,443	986,443	986,443	986,443	9					

RY	Development Period in Months																					
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276
1994																						
1995																						
1996																						
1997																						
1998	0.919	1.000	1.000	1.000	1.000	1.000	1.000	1.000	5.060	1.000	1.000	1.000	0.941	0.860	1.000	1.000	1.000	1.000				
1999	2.823	1.728	1.311	1.028	1.000	1.002	1.000	1.223	1.011	1.020	1.017	0.999	0.985	1.000	1.000	1.050	1.000					
2000	0.962	1.129	1.031	0.939	0.956	1.047	1.016	1.044	1.052	1.000	1.000	0.998	1.001	0.993	1.000	1.000						
2001	1.249	1.030	0.860	0.957	1.024	1.053	1.037	1.158	1.088	1.010	1.145	1.020	1.010	1.065	1.015							
2002	1.400	0.975	0.747	0.999	1.094	1.051	0.969	1.000	0.961	1.006	1.000	1.208	0.910	1.031								
2003	0.917	0.827	1.143	1.042	1.096	1.030	1.030	1.011	1.061	1.240	0.987	1.006	0.967									
2004	1.017	1.163	1.104	1.448	1.013	1.039	1.007	1.279	1.013	0.998	0.994											
2005	0.924	1.035	1.032	0.955	1.137	1.010	1.011	0.988	1.000	1.002	1.000											
2006	1.741	1.117	1.068	1.045	1.040	1.074	1.037	1.282	0.879	1.057												
2007	0.951	0.996	0.948	0.974	1.000	1.099	1.009	0.999	0.954													
2008	1.200	1.023	0.966	1.026	1.127	1.000	1.000	1.083														
2009	1.279	1.001	1.295	1.058	1.133	1.003	1.000															
2010	0.567	1.112	1.246	1.147	1.203	1.000																
2011	1.092	1.390	0.942	0.989	1.006																	
2012	1.147	1.410	0.953	1.053																		
2013	1.060	1.007	1.066																			
2014	6.773	0.940																				
2015	1.693																					
VOL WTD 3	1.683	1.170	0.980	1.048	1.097	1.001	1.004	1.149	0.937	1.017	0.994	1.063	0.979	1.047	1.009	1.030	1.000	1.000	NA	NA	NA	NA
VOL WTD 5	1.375	1.200	1.032	1.047	1.072	1.049	1.015	1.152	0.977	1.043	1.052	1.039	0.982	1.029	1.009	1.030	1.000	1.000	NA	NA	NA	NA
VOL WTD ALL	1.208	1.095	0.989	1.036	1.047	1.039	1.013	1.127	1.034	1.027	1.041	1.031	0.980	1.029	1.009	1.030	1.000					

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Incurred Losses

RY	Development in Months																							
	<u>12</u>	<u>24</u>	<u>36</u>	<u>48</u>	<u>60</u>	<u>72</u>	<u>84</u>	<u>96</u>	<u>108</u>	<u>120</u>	<u>132</u>	<u>144</u>	<u>156</u>	<u>168</u>	<u>180</u>	<u>192</u>	<u>204</u>	<u>216</u>	<u>228</u>	<u>240</u>	<u>252</u>	<u>264</u>	<u>276</u>	
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	127,001	116,714	116,714	116,714	116,714	116,714	116,714	116,714	116,714	590,611	590,611	590,611	590,611	555,611	478,042	478,042	478,042	478,042	478,042	478,042				
1999	308,314	870,343	1,504,209	1,971,983	2,027,001	2,026,436	2,030,044	2,030,044	2,482,580	2,510,580	2,561,027	2,603,820	2,601,196	2,561,795	2,561,795	2,561,795	2,689,230	2,689,230						
2000	1,026,004	986,880	1,114,568	1,148,569	1,078,568	1,030,942	1,079,607	1,097,363	1,145,515	1,205,440	1,205,440	1,205,440	1,202,646	1,203,928	1,195,793	1,195,793	1,195,793							
2001	3,289,000	4,108,645	4,233,509	3,642,391	3,484,058	3,566,802	3,756,792	3,895,867	4,511,171	4,910,015	4,958,003	5,677,351	5,790,979	5,849,503	6,227,944	6,318,643								
2002	1,797,008	2,516,405	2,453,720	1,833,500	1,832,500	2,004,966	2,106,298	2,041,647	2,041,647	1,961,513	1,972,533	1,972,533	2,381,937	2,167,740	2,234,838									
2003	1,120,100	1,027,589	849,418	970,556	1,011,191	1,108,245	1,141,783	1,175,610	1,188,633	1,261,406	1,563,735	1,542,848	1,552,847	1,501,010										
2004	1,125,017	1,144,322	1,331,067	1,470,142	2,128,424	2,155,771	2,240,562	2,256,189	2,886,714	2,924,415	2,919,415	2,900,827	2,884,520											
2005	1,543,485	1,425,516	1,475,649	1,522,726	1,454,148	1,653,994	1,671,234	1,688,897	1,668,486	1,668,486	1,672,486	1,672,486												
2006	674,273	1,174,072	1,310,933	1,399,553	1,462,786	1,521,109	1,634,236	1,694,721	2,173,374	1,909,874	2,018,289													
2007	1,288,241	1,225,463	1,220,733	1,156,901	1,127,089	1,127,090	1,238,935	1,250,577	1,249,903	1,192,870														
2008	415,004	497,948	509,298	492,059	504,948	569,232	569,232	569,232	616,446															
2009	426,280	545,273	545,773	706,544	747,814	847,182	849,952	849,952																
2010	542,005	307,495	341,816	426,049	488,528	587,710	587,710																	
2011	620,289	677,051	941,165	886,346	876,176	881,631																		
2012	1,325,875	1,520,925	2,145,183	2,044,128	2,153,132																			
2013	1,010,011	1,070,292	1,077,876	1,149,154																				
2014	123,002	833,119	783,406																					
2015	415,146	702,914																						
2016	702,006																							

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Determination of Pure Premium

(1)	(2)	(3)	(4)	(5)	(6)
<u>RY</u>	<u>PAID LDM</u> <u>ULTIMATE</u>	<u>INC LDM</u> <u>ULTIMATE</u>	<u>SELECTED</u> <u>ULTIMATE</u>	<u>POLICIES</u> <u>IN FORCE</u>	<u>PURE</u> <u>PREMIUM</u>
2008	841,626	621,668	731,647	517	1,415
2009	993,889	966,086	979,987	563	1,741
2010	604,667	676,398	640,533	578	1,108
2011	1,392,082	1,053,835	1,222,958	810	1,510
2012	3,316,313	2,694,077	3,005,195	975	3,082
2013	1,848,839	1,489,084	1,668,962	1,003	1,664
2014	783,406	1,003,910	893,658	1,030	868
2015	712,583	986,443	849,513	1,021	832
2016	1,521,747	1,190,215	1,355,981	1,010	1,343
TOTAL	12,015,152	10,681,716	11,348,434	7,507	1,512

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2008	517	1,415	939	1,507	779,326	38.7%	301,310	516,229	817,539	616,446	201,093	100,217	1,581
2009	563	1,741	1,216	1,432	806,233	42.7%	344,537	569,158	913,695	849,952	63,744	280,794	1,623
2010	578	1,108	815	1,360	786,328	45.8%	359,867	327,938	687,805	587,710	100,095	259,772	1,190
2011	810	1,510	1,168	1,292	1,046,850	48.9%	511,762	711,550	1,223,312	881,631	341,681	170,081	1,510
2012	975	3,082	2,511	1,228	1,197,092	53.8%	643,651	1,533,202	2,176,853	2,153,132	23,721	619,930	2,233
2013	1,003	1,664	1,427	1,166	1,169,896	59.3%	693,404	753,022	1,446,426	1,149,154	297,273	396,132	1,442
2014	1,030	868	783	1,108	1,141,320	68.0%	775,763	19,091	794,854	783,406	11,448	764,315	772
2015	1,021	832	790	1,053	1,074,780	75.8%	814,164	172,789	986,953	702,914	284,039	530,125	967
2016	1,010	1,343	1,343	1,000	1,010,040	90.4%	913,248	145,829	1,059,077	702,006	357,071	556,177	1,049
TOTAL	7,507				9,011,863		5,357,707	4,748,807	10,106,514	8,426,350	1,680,165	3,677,542	1,346
	<u>Pure Premium Selection</u>				Trend =	0.950							
	3-Year Average x Latest		1,000										
	5-Year Average x Latest		1,336										
	All Year Average x Latest		1,206										
	Selected Pure Premium		1,000										

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Insurance AST  
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POLICIES IN FORCE	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT IBNR	EXPECTED IBNR	INCURRED LOSSES	INDICATED ULTIMATE	PAID LOSSES	UNPAID LOSS	CASE RESERVE	ULTIMATE PURE PREM
2008	517	1,415	939	1,507	779,326	0.8%	6,546	616,446	622,992	516,229	106,763	100,217	1,205
2009	563	1,741	1,216	1,432	806,233	12.0%	96,918	849,952	946,870	569,158	377,712	280,794	1,682
2010	578	1,108	815	1,360	786,328	13.1%	103,102	587,710	690,812	327,938	362,874	259,772	1,195
2011	810	1,510	1,168	1,292	1,046,850	16.3%	171,062	881,631	1,052,693	711,550	341,143	170,081	1,300
2012	975	3,082	2,511	1,228	1,197,092	20.1%	240,365	2,153,132	2,393,497	1,533,202	860,295	619,930	2,455
2013	1,003	1,664	1,427	1,166	1,169,896	22.8%	267,066	1,149,154	1,416,219	753,022	663,197	396,132	1,412
2014	1,030	868	783	1,108	1,141,320	22.0%	250,685	783,406	1,034,091	19,091	1,015,000	764,315	1,004
2015	1,021	832	790	1,053	1,074,780	28.7%	308,919	702,914	1,011,833	172,789	839,044	530,125	991
2016	1,010	1,343	1,343	1,000	1,010,040	41.0%	414,304	702,006	1,116,310	145,829	970,481	556,177	1,105
TOTAL	7,507				9,011,863		1,858,967	8,426,350	10,285,317	4,748,807	5,536,510	3,677,542	1,370
	<u>Pure Premium Selection</u>				Trend =	0.950							
	3-Year Average x Latest		1,000										
	5-Year Average x Latest		1,336										
	All Year Average x Latest		1,206										
	Selected Pure Premium		1,000										



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Summary of Paid Development Method

(1) RY	(2) PAID LDM <u>ULTIMATE</u>	(3) SELECTED <u>ULTIMATE</u>	(4) PAID <u>LOSS</u>	(5) INCURRED <u>LOSS</u>	(6) CASE <u>RESERVE</u>	(7) IBNR <u>RESERVE</u>
1994	-	-	-	-	-	-
1995	123,316	106,826	106,826	106,826	-	-
1996	120,337	120,337	103,782	119,916	16,134	421
1997	-	-	-	-	-	-
1998	743,472	635,092	635,092	635,092	-	-
1999	1,534,041	1,534,041	1,294,320	1,405,690	111,371	128,350
2000	3,681,036	5,247,170	3,022,541	5,247,170	2,224,629	-
2001	1,190,537	1,659,746	955,109	1,659,746	704,637	-
2002	312,239	436,415	239,493	436,415	196,922	-
2003	629,063	629,063	471,503	552,376	80,873	76,688
2004	2,161,692	2,161,692	1,554,162	1,818,773	264,611	342,919
2005	115,356	79,838	79,838	79,838	-	-
2006	-	-	-	-	-	-
2007	73,413	41,750	41,750	41,750	-	-
2008	100,515	51,787	51,787	51,787	-	-
2009	243,961	243,961	110,661	179,761	69,100	64,200
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	346,908	346,908	53,789	195,789	142,000	151,119
2016	-	-	-	-	-	-
TOTAL	11,375,885	13,294,625	8,720,651	12,530,928	3,810,277	763,697

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Development of Losses to Ultimate

	Development Period in Months																							
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - ULT	
1994																							1.150	
1995							2.144	1.250	1.102	1.016	1.278	1.153	1.000	1.048	1.141	1.010	1.042	1.000	1.000	1.000	1.000	1.004	1.150	
1996										1.967	1.516	1.030	1.000	1.104	1.620	1.057	1.109	1.113	1.009	1.011	1.004	1.004	1.150	
1997																				1.005	1.004	1.004	1.150	
1998		2.879	1.306	1.090	1.020	1.000	1.056	1.070	1.037	1.019	1.055	1.046	1.006	1.009	1.000	1.000	1.000	1.000	1.004	1.005	1.004	1.004	1.150	
1999	1.701	2.649	1.129	1.235	1.136	1.319	1.105	1.061	1.055	1.049	1.055	1.024	1.016	1.002	1.007	1.007	1.035	1.012	1.004	1.005	1.004	1.004	1.150	
2000	1.962	1.171	1.107	1.048	1.046	1.070	1.068	1.150	1.105	1.047	1.036	1.019	1.040	1.028	1.016	1.035	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2001			7.454	2.945	2.045	1.350	1.237	1.305	1.137	1.164	1.109	1.073	1.141	1.052	1.205	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2002		4.517	2.551	1.068	1.086	1.000	1.038	1.904	1.113	1.019	1.000	1.065	1.000	1.000	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2003	1.224	1.255	1.000	1.000	1.000	1.317	1.736	1.067	1.029	1.286	1.111	1.054	1.071	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2004		3.475	1.113	1.759	1.221	1.157	1.322	1.092	1.254	1.712	1.027	1.055	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2005	1.794	1.493	1.622	1.000	1.316	1.173	1.202	1.079	1.000	1.000	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.004	1.150	
2006											1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2007		2.517	1.169	1.000	1.000	1.000	1.000	1.000	1.000	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2008		1.226	1.100	1.000	1.000	1.000	1.000	1.000	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2009			1.105	1.340	1.052	1.375	1.089	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2010							1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2011						1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2012					1.102	1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2013				1.148	1.102	1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2014			1.166	1.148	1.102	1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2015		1.528	1.166	1.148	1.102	1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
2016	1.857	1.528	1.166	1.148	1.102	1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.004	1.150	
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1998	-	113,506	326,771	426,734	465,016	474,091	474,091	500,870	536,142	555,872	566,448	597,852	625,365	629,257	635,092	635,092	635,092	635,092	635,092	637,839	641,191	644,054	646,497	743,472
1999	91,601	155,804	412,759	466,204	575,644	653,770	862,519	953,244	1,011,272	1,067,094	1,119,362	1,181,084	1,209,850	1,229,349	1,232,121	1,241,346	1,250,602	1,294,320	1,310,415	1,316,083	1,322,999	1,328,907	1,333,948	1,534,041
2000	600,543	1,178,120	1,380,065	1,527,820	1,601,730	1,675,915	1,792,516	1,914,991	2,202,232	2,433,794	2,547,274	2,638,146	2,687,862	2,795,225	2,873,605	2,920,207	3,022,541	3,105,809	3,144,430	3,158,033	3,174,628	3,188,803	3,200,901	3,681,036
2001	-	-	4,285	31,943	94,057	192,393	259,731	321,220	419,351	476,821	555,214	615,741	660,726	753,773	792,848	955,109	977,563	1,004,494	1,016,985	1,021,385	1,026,752	1,031,336	1,035,249	1,190,537
2002	-	7,498	33,870	86,415	92,333	100,309	100,309	104,163	198,304	220,667	224,817	224,817	239,493	239,493	239,493	250,494	256,383	263,446	266,722	267,876	269,284	270,486	271,512	312,239
2003	75,879	92,879	116,529	116,529	116,529	116,529	153,490	266,468	284,207	292,415	376,033	417,688	440,376	471,503	482,503	504,667	516,531	530,761	537,361	539,686	542,522	544,944	547,012	629,063
2004	-	48,087	167,082	185,942	327,157	399,428	462,288	611,344	667,682	837,489	1,433,954	1,473,129	1,554,162	1,620,255	1,658,057	1,734,220	1,774,990	1,823,889	1,846,570	1,854,558	1,864,303	1,872,627	1,879,732	2,161,692
2005	9,181	16,467	24,588	39,884	39,884	52,485	61,585	74,021	79,838	79,838	79,838	79,838	82,936	86,463	88,480	92,544	94,720	97,329	98,540	98,966	99,486	99,930	100,309	115,356
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	14,192	35,720	41,750	41,750	41,750	41,750	41,750	41,750	48,347	50,809	52,780	55,025	56,309	58,895	60,280	61,941	62,711	62,982	63,313	63,596	63,837	63,837	73,413
2008	-	38,408	47,087	51,787	51,787	51,787	51,787	51,787	51,787	57,164	66,196	69,567	72,266	75,339	77,097	80,638	82,534	84,808	85,863	86,234	86,687	87,074	87,405	100,515
2009	-	-	47,443	52,422	70,244	73,919	101,655	110,661	125,692	138,742	160,665	168,845	175,397	182,856	187,122	195,718	200,319	205,838	208,397	209,299	210,399	211,338	212,140	243,961
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	-	53,789	82,203	95,857	110,064	121,344	138,104	157,358	178,732	197,289	228,463	240,095	249,412	260,019	266,085	278,308	284,850	292,698	296,337	297,619	299,183	300,519	301,659	346,908
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Selection of Loss Development Factors

RY	Development Period in Months																					
	<u>12 - 24</u>	<u>24 - 36</u>	<u>36 - 48</u>	<u>48 - 60</u>	<u>60 - 72</u>	<u>72 - 84</u>	<u>84 - 96</u>	<u>96 - 108</u>	<u>108 - 120</u>	<u>120 - 132</u>	<u>132 - 144</u>	<u>144 - 156</u>	<u>156 - 168</u>	<u>168 - 180</u>	<u>180 - 192</u>	<u>192 - 204</u>	<u>204 - 216</u>	<u>216 - 228</u>	<u>228 - 240</u>	<u>240 - 252</u>	<u>252 - 264</u>	<u>264 - 276</u>
1994																						
1995							2.144	1.250	1.102	1.016	1.278	1.153	1.000	1.048	1.141	1.010	1.042	1.000	1.000	1.000	1.000	
1996										1.967	1.516	1.030	1.000	1.104	1.620	1.057	1.109	1.113	1.009	1.011		
1997																						
1998		2.879	1.306	1.090	1.020	1.000	1.056	1.070	1.037	1.019	1.055	1.046	1.006	1.009	1.000	1.000	1.000	1.000				
1999	1.701	2.649	1.129	1.235	1.136	1.319	1.105	1.061	1.055	1.049	1.055	1.024	1.016	1.002	1.007	1.007	1.035					
2000	1.962	1.171	1.107	1.048	1.046	1.070	1.068	1.150	1.105	1.047	1.036	1.019	1.040	1.028	1.016	1.035						
2001			7.454	2.945	2.045	1.350	1.237	1.305	1.137	1.164	1.109	1.073	1.141	1.052	1.205							
2002		4.517	2.551	1.068	1.086	1.000	1.038	1.904	1.113	1.019	1.000	1.065	1.000	1.000								
2003	1.224	1.255	1.000	1.000	1.000	1.317	1.736	1.067	1.029	1.286	1.111	1.054	1.071									
2004		3.475	1.113	1.759	1.221	1.157	1.322	1.092	1.254	1.712	1.027	1.055										
2005	1.794	1.493	1.622	1.000	1.316	1.173	1.202	1.079	1.000	1.000	1.000											
2006																						
2007		2.517	1.169	1.000	1.000	1.000	1.000	1.000	1.000													
2008		1.226	1.100	1.000	1.000	1.000	1.000	1.000														
2009			1.105	1.340	1.052	1.375	1.089															
2010																						
2011																						
2012																						
2013																						
2014																						
2015																						
VOL WTD 3	NA	NA	NA	NA	1.052	1.221	1.046	1.000	1.000	1.650	1.043	1.056	1.093	1.031	1.045	1.023	1.023	1.014	1.004	1.005	1.000	NA
VOL WTD 5	NA	NA	1.105	1.171	1.022	1.166	1.084	1.080	1.166	1.478	1.053	1.040	1.048	1.022	1.039	1.024	1.028	1.012	1.004	1.005	1.000	NA
VOL WTD ALL	1.857	1.528	1.166	1.148	1.102	1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.000	NA
ARITH 3	NA	NA	NA	NA	1.052	1.188	1.030	1.000	1.000	1.356	1.046	1.058	1.071	1.027	1.076	1.014	1.017	1.057	1.004	1.005	1.000	NA
ARITH 5	NA	NA	1.105	1.170	1.017	1.125	1.073	1.043	1.071	1.254	1.049	1.053	1.053	1.018	1.057	1.025	1.047	1.038	1.004	1.005	1.000	NA
ARITH ALL	1.670	2.354	1.878	1.317	1.175	1.160	1.250	1.180	1.083	1.228	1.119	1.058	1.034	1.035	1.165	1.022	1.047	1.038	1.004	1.005	1.000	NA
5 YR HI LO	NA	NA	NA	NA	1.000	1.000	1.044	1.039	1.014	1.152	1.045	1.058	1.042	1.013	1.012	1.021	1.039	1.000	NA	NA	NA	TAIL
SELECTED	1.857	1.528	1.166	1.148	1.102	1.138	1.139	1.136	1.104	1.158	1.051	1.039	1.043	1.023	1.046	1.024	1.028	1.012	1.004	1.005	1.004	1.150

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Paid Losses

RY	Development in Months																						
	<u>12</u>	<u>24</u>	<u>36</u>	<u>48</u>	<u>60</u>	<u>72</u>	<u>84</u>	<u>96</u>	<u>108</u>	<u>120</u>	<u>132</u>	<u>144</u>	<u>156</u>	<u>168</u>	<u>180</u>	<u>192</u>	<u>204</u>	<u>216</u>	<u>228</u>	<u>240</u>	<u>252</u>	<u>264</u>	<u>276</u>
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	19,195	41,156	51,445	56,701	57,626	73,664	84,921	84,921	88,971	101,542	102,511	106,826	106,826	106,826	106,826	106,826	106,826
1996	-	-	-	-	-	-	-	-	-	14,203	27,940	42,359	43,615	43,615	48,148	77,977	82,406	91,416	101,779	102,681	103,782	-	-
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	-	113,506	326,771	426,734	465,016	474,091	474,091	500,870	536,142	555,872	566,448	597,852	625,365	629,257	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092
1999	91,601	155,804	412,759	466,204	575,644	653,770	862,519	953,244	1,011,272	1,067,094	1,119,362	1,181,084	1,209,850	1,229,249	1,232,121	1,241,346	1,250,602	1,294,320	-	-	-	-	-
2000	600,543	1,178,120	1,380,065	1,527,820	1,601,730	1,675,915	1,792,516	1,914,991	2,202,232	2,433,794	2,547,274	2,638,146	2,687,862	2,795,225	2,873,605	2,920,207	3,022,541	-	-	-	-	-	-
2001	-	-	4,285	31,943	94,057	192,393	259,731	321,220	419,351	476,821	555,214	615,741	660,726	753,773	792,848	955,109	-	-	-	-	-	-	-
2002	-	7,498	33,870	86,415	92,333	100,309	100,309	104,163	198,304	220,667	224,817	224,817	239,493	239,493	239,493	-	-	-	-	-	-	-	-
2003	75,879	92,879	116,529	116,529	116,529	116,529	153,490	266,468	284,207	292,415	376,033	417,688	440,376	471,503	-	-	-	-	-	-	-	-	-
2004	-	48,087	167,082	185,942	327,157	399,428	462,288	611,344	667,682	837,489	1,433,954	1,473,129	1,554,162	-	-	-	-	-	-	-	-	-	-
2005	9,181	16,467	24,588	39,884	39,884	52,485	61,585	74,021	79,838	79,838	79,838	79,838	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	14,192	35,720	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	38,408	47,087	51,787	51,787	51,787	51,787	51,787	51,787	51,787	-	-	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	47,443	52,422	70,244	73,919	101,655	110,661	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	-	53,789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Summary of Incurred Development Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)
RY	INC LDM <u>ULTIMATE</u>	PAID <u>LOSS</u>	INCURRED <u>LOSS</u>	CASE <u>RESERVE</u>	IBNR <u>RESERVE</u>	UNPAID <u>LOSS</u>
1994	-	-	-	-	-	-
1995	106,826	106,826	106,826	-	-	-
1996	119,916	103,782	119,916	16,134	-	16,134
1997	-	-	-	-	-	-
1998	635,092	635,092	635,092	-	-	-
1999	1,425,054	1,294,320	1,405,690	111,371	19,364	130,734
2000	5,394,332	3,022,541	5,247,170	2,224,629	147,162	2,371,791
2001	1,712,949	955,109	1,659,746	704,637	53,203	757,840
2002	479,487	239,493	436,415	196,922	43,072	239,994
2003	596,638	471,503	552,376	80,873	44,262	125,135
2004	1,969,099	1,554,162	1,818,773	264,611	150,326	414,937
2005	92,072	79,838	79,838	-	12,234	12,234
2006	-	-	-	-	-	-
2007	51,275	41,750	41,750	-	9,525	9,525
2008	68,380	51,787	51,787	-	16,593	16,593
2009	234,734	110,661	179,761	69,100	54,973	124,073
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	346,456	53,789	195,789	142,000	150,667	292,667
2016	-	-	-	-	-	-
TOTAL	13,232,309	8,720,651	12,530,928	3,810,277	701,381	4,511,658

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Development of Losses to Ultimate

RY	Development Period in Months																							
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276	276 - ULT	
1994																								1,000
1995	1,000	100000.000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,067	1,000	1,000	0.805	1,291	1,096	0.885	0.994	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1996	0.231	1,000	1,000	2,333	2,000	1,000	0.286			1,079	1,260	1,000	1,000	1,000	1,505	1,058	1,000	1,108	1,000	1,000	1,000	1,000	1,000	1,000
1997																								1,000
1998	1,062	2,451	1,173	0.998	1,460	1,000	0.738	0.814	0.872	1,015	1,047	0.920	1,000	0.988	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1999	2,490	0.658	1,022	1,103	1,251	0.943	1,026	1,041	1,044	0.966	1,024	1,015	1,000	0.964	1,015	1,000	1,023	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2000	1,181	1,060	1,072	1,020	0.993	1,022	1,108	1,020	1,244	1,054	0.991	1,172	0.992	0.996	1,049	1,007	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2001	3,476	1,429	0.813	0.967	0.918	1,055	1,079	1,009	1,081	1,132	0.972	1,016	1,008	0.934	1,172	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2002	3,261	0.902	0.742	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2003	1,004	1,185	1,031	1,000	1,114	1,298	1,128	0.958	1,150	1,051	1,000	0.832	1,147	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2004	0.860	3,207	0.981	1,000	0.999	1,000	1,211	0.977	1,540	1,142	1,031	1,043	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2005	0.922	0.888	1,000	0.974	1,119	1,000	1,367	0.872	1,000	1,000	1,000	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2006										1,005	1,065	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2007	0.860	1,000	0.485	1,000	1,000	1,000	1,000	1,000	1,000	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2008	0.577	1,000	0.898	1,000	1,000	1,000	1,000	1,000	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2009	1,000	2,119	1,000	1,000	1,000	1,346	1,260	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2010							1,040	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2011						1,022	1,040	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2012					1,079	1,022	1,040	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2013				1,017	1,079	1,022	1,040	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2014			0.981	1,017	1,079	1,022	1,040	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2015	Excl.	1,185	0.981	1,017	1,079	1,022	1,040	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
2016	1,523	1,185	0.981	1,017	1,079	1,022	1,040	0.989	1,075	1,060	1,005	1,065	1,002	0.983	1,065	1,004	1,014	1,014	1,000	1,000	1,000	1,000	1,000	1,000
RY	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	ULT
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	1	1	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	106,701	106,701	106,701	85,921	110,921	121,542	107,511	106,826	106,826	106,826	106,826	106,826	106,826	106,826
1996	65,000	15,001	15,001	15,001	35,001	70,001	70,001	20,000	-	50,001	53,940	67,940	67,940	67,940	67,940	102,248	108,206	108,206	119,916	119,916	119,916	119,916	119,916	119,916
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1998	282,000	299,445	733,820	861,104	859,104	1,254,635	1,254,635	925,870	753,994	657,142	667,199	698,719	642,886	642,886	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092
1999	576,051	1,434,131	943,131	963,453	1,062,740	1,329,280	1,254,083	1,286,407	1,338,653	1,397,656	1,350,524	1,383,455	1,403,917	1,403,917	1,353,916	1,373,691	1,373,691	1,405,690	1,425,054	1,425,054	1,425,054	1,425,054	1,425,054	1,425,054
2000	2,102,117	2,481,718	2,630,090	2,819,602	2,876,382	2,857,665	2,921,118	3,236,350	3,301,716	4,107,206	4,330,459	4,291,056	5,028,325	4,988,325	4,966,651	5,210,072	5,247,170	5,321,034	5,394,332	5,394,332	5,394,332	5,394,332	5,394,332	5,394,332
2001	302,096	1,050,043	1,500,023	1,219,231	1,178,913	1,082,184	1,141,921	1,231,922	1,243,082	1,344,127	1,522,137	1,480,155	1,503,301	1,515,771	1,415,769	1,659,746	1,666,218	1,689,674	1,712,949	1,712,949	1,712,949	1,712,949	1,712,949	1,712,949
2002	200,004	652,311	588,414	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	464,595	466,406	472,972	479,487	479,487	479,487	479,487	479,487	479,487
2003	250,003	250,882	297,387	306,532	306,532	341,531	443,402	500,006	478,961	550,916	578,916	578,916	481,483	552,376	543,041	578,106	580,361	588,530	596,638	596,638	596,638	596,638	596,638	596,638
2004	300,004	258,090	827,611	812,287	812,287	811,862	811,862	983,570	961,290	1,480,232	1,690,604	1,743,171	1,818,773	1,823,020	1,792,214	1,907,940	1,915,380	1,942,343	1,969,099	1,969,099	1,969,099	1,969,099	1,969,099	1,969,099
2005	75,000	69,181	61,467	61,467	59,884	66,985	66,985	91,585	79,838	79,838	79,838	79,838	85,043	85,241	83,801	89,212	89,560	90,820	92,072	92,072	92,072	92,072	92,072	92,072
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	100,001	86,012	86,012	41,750	41,750	41,750	41,750	41,750	41,750	41,750	44,259	44,462	47,361	47,471	46,669	49,683	49,877	50,579	51,275	51,275	51,275	51,275	51,275	51,275
2008	100,000	57,687	57,687	51,787	51,787	51,787	51,787	51,787	51,787	51,787	55,677	59,023	59,294	63,159	63,307	62,237	66,256	66,514	67,450	68,380	68,380	68,380	68,380	68,380
2009	50,001	50,001	105,943	105,943	105,943	105,943	142,619	179,761	177,775	191,128	202,615	203,544	216,814	217,320	213,648	227,444	228,331	231,545	234,734	234,734	234,734	234,734	234,734	234,734
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	1	195,789	232,061	227,622	231,482	249,684	255,131	265,318	262,387	282,096	299,049	300,421	320,007	320,754	315,334	335,695	337,005	341,749	346,456	346,456	346,456	346,456	346,456	346,456
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Selection of Loss Development Factors

RY	Development Period in Months																					
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 - 192	192 - 204	204 - 216	216 - 228	228 - 240	240 - 252	252 - 264	264 - 276
1994																						
1995	1.000	100000.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.067	1.000	1.000	0.805	1.291	1.096	0.885	0.994	1.000	1.000	1.000	1.000	
1996	0.231	1.000	1.000	2.333	2.000	1.000	0.286			1.079	1.260	1.000	1.000	1.000	1.505	1.058	1.000	1.108	1.000	1.000		
1997																						
1998	1.062	2.451	1.173	0.998	1.460	1.000	0.738	0.814	0.872	1.015	1.047	0.920	1.000	0.988	1.000	1.000	1.000	1.000				
1999	2.490	0.658	1.022	1.103	1.251	0.943	1.026	1.041	1.044	0.966	1.024	1.015	1.000	0.964	1.015	1.000	1.023					
2000	1.181	1.060	1.072	1.020	0.993	1.022	1.108	1.020	1.244	1.054	0.991	1.172	0.992	0.996	1.049	1.007						
2001	3.476	1.429	0.813	0.967	0.918	1.055	1.079	1.009	1.081	1.132	0.972	1.016	1.008	0.934	1.172							
2002	3.261	0.902	0.742	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
2003	1.004	1.185	1.031	1.000	1.114	1.298	1.128	0.958	1.150	1.051	1.000	0.832	1.147									
2004	0.860	3.207	0.981	1.000	0.999	1.000	1.211	0.977	1.540	1.142	1.031	1.043										
2005	0.922	0.888	1.000	0.974	1.119	1.000	1.367	0.872	1.000	1.000	1.000											
2006																						
2007	0.860	1.000	0.485	1.000	1.000	1.000	1.000	1.000	1.000													
2008	0.577	1.000	0.898	1.000	1.000	1.000	1.000	1.000	1.000													
2009	1.000	2.119	1.000	1.000	1.000	1.346	1.260															
2010																						
2011																						
2012																						
2013																						
2014																						
2015	Excl.																					
VOL WTD 3	NA	NA	NA	NA	1.000	1.233	1.157	1.000	1.000	1.135	1.022	0.992	1.034	0.982	1.066	1.005	1.016	1.016	1.000	1.000	1.000	NA
VOL WTD 5	NA	NA	1.000	1.000	1.000	1.184	1.204	0.971	1.378	1.094	1.002	1.087	1.005	0.980	1.061	1.006	1.014	1.014	1.000	1.000	1.000	NA
VOL WTD ALL	1.523	1.185	0.981	1.017	1.079	1.022	1.040	0.989	1.167	1.060	1.005	1.065	1.002	0.983	1.065	1.004	1.014	1.014	1.000	1.000	1.000	NA
ARITH 3	NA	NA	NA	NA	1.000	1.173	1.087	1.000	1.000	1.071	1.010	0.958	1.052	0.977	1.079	1.002	1.012	1.054	1.000	1.000	1.000	NA
ARITH 5	NA	NA	1.000	1.000	1.000	1.115	1.157	0.962	1.173	1.048	1.001	1.013	1.030	0.976	1.059	1.016	1.004	1.036	1.000	1.000	1.000	NA
ARITH ALL	1.379	NA	0.940	1.107	1.143	1.051	1.016	0.972	1.093	1.051	1.033	1.000	0.994	1.025	1.139	0.990	1.004	1.036	1.000	1.000	1.000	NA
5 YR HI LO	NA	NA	NA	NA	1.000	1.000	1.130	0.989	1.075	1.025	1.000	1.020	1.003	0.983	1.032	1.004	1.000	1.000	NA	NA	NA	TAIL
SELECTED	1.523	1.185	0.981	1.017	1.079	1.022	1.040	0.989	1.075	1.060	1.005	1.065	1.002	0.983	1.065	1.004	1.014	1.014	1.000	1.000	1.000	1.000

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Incurred Losses

RY	Development in Months																							
	<u>12</u>	<u>24</u>	<u>36</u>	<u>48</u>	<u>60</u>	<u>72</u>	<u>84</u>	<u>96</u>	<u>108</u>	<u>120</u>	<u>132</u>	<u>144</u>	<u>156</u>	<u>168</u>	<u>180</u>	<u>192</u>	<u>204</u>	<u>216</u>	<u>228</u>	<u>240</u>	<u>252</u>	<u>264</u>	<u>276</u>	
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1995	1	1	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	106,701	106,701	106,701	85,921	110,921	121,542	107,511	106,826	106,826	106,826	106,826	106,826	106,826	
1996	65,000	15,001	15,001	15,001	35,001	70,001	70,001	20,000	-	50,001	53,940	67,940	67,940	67,940	67,940	102,248	108,206	108,206	119,916	119,916	119,916	119,916	119,916	
1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1998	282,000	299,445	733,820	861,104	859,104	1,254,635	1,254,635	925,870	753,994	657,142	667,199	698,719	642,886	642,886	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	635,092	
1999	576,051	1,434,131	943,131	963,453	1,062,740	1,329,280	1,254,083	1,286,407	1,338,653	1,397,656	1,350,524	1,383,455	1,403,917	1,403,917	1,353,916	1,373,691	1,373,691	1,405,690	1,405,690	1,405,690	1,405,690	1,405,690	1,405,690	
2000	2,102,117	2,481,718	2,630,090	2,819,602	2,876,382	2,857,665	2,921,118	3,236,350	3,301,716	4,107,206	4,330,459	4,291,056	5,028,325	4,988,325	4,966,651	5,210,072	5,247,170	5,247,170	5,247,170	5,247,170	5,247,170	5,247,170	5,247,170	
2001	302,096	1,050,043	1,500,023	1,219,231	1,178,913	1,082,184	1,141,921	1,231,922	1,243,082	1,344,127	1,522,137	1,480,155	1,503,301	1,515,771	1,415,769	1,659,746	1,659,746	1,659,746	1,659,746	1,659,746	1,659,746	1,659,746	1,659,746	
2002	200,004	652,311	588,414	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	436,415	
2003	250,003	250,882	297,387	306,532	306,532	341,531	443,402	500,006	478,961	550,916	578,916	578,916	481,483	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	552,376	
2004	300,004	258,090	827,611	812,287	812,287	811,862	811,862	983,570	961,290	1,480,232	1,690,604	1,743,171	1,818,773	1,818,773	1,818,773	1,818,773	1,818,773	1,818,773	1,818,773	1,818,773	1,818,773	1,818,773	1,818,773	
2005	75,000	69,181	61,467	61,467	59,884	66,985	66,985	91,585	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	79,838	
2006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2007	100,001	86,012	86,012	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	41,750	
2008	100,000	57,687	57,687	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	51,787	
2009	50,001	50,001	105,943	105,943	105,943	105,943	142,619	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	179,761	
2010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2015	1	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	195,789	
2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Determination of Pure Premium

(1) <u>RY</u>	(2) PAID LDM <u>ULTIMATE</u>	(3) INC LDM <u>ULTIMATE</u>	(4) SELECTED <u>ULTIMATE</u>	(5) POTENTIAL <u>SITES</u>	(6) PURE <u>PREMIUM</u>
2008	51,787	68,380	60,083	2,055	29
2009	243,961	234,734	239,348	2,051	117
2010	-	-	-	2,049	-
2011	-	-	-	2,044	-
2012	-	-	-	2,040	-
2013	-	-	-	2,040	-
2014	-	-	-	2,039	-
2015	346,908	346,456	346,682	2,038	170
2016	-	-	-	2,038	-
TOTAL	642,656	649,570	646,113	18,394	35

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Paid Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POTENTIAL SITES	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT UNPAID	EXPECTED UNPAID	PAID LOSSES	INDICATED ULTIMATE	INCURRED LOSSES	IBNR RESERVE	CASE RESERVE	ULTIMATE PURE PREM
2008	2,055	29	34	36	74,940	44.7%	33,478	51,787	85,264	51,787	33,478	-	41
2009	2,051	117	134	37	76,290	47.6%	36,291	110,661	146,952	179,761	(32,809)	69,100	72
2010	2,049	-	-	38	77,740	50.0%	38,902	-	38,902	-	38,902	-	19
2011	2,044	-	-	39	79,101	53.4%	42,277	-	42,277	-	42,277	-	21
2012	2,040	-	-	39	80,525	58.7%	47,260	-	47,260	-	47,260	-	23
2013	2,040	-	-	40	82,136	63.9%	52,519	-	52,519	-	52,519	-	26
2014	2,039	-	-	41	83,738	69.7%	58,394	-	58,394	-	58,394	-	29
2015	2,038	170	174	42	85,370	82.0%	70,030	53,789	123,819	195,789	(71,970)	142,000	61
2016	2,038	-	-	43	87,078	96.5%	84,008	-	84,008	-	84,008	-	41
TOTAL	18,394				726,919		463,159	216,237	679,396	427,337	252,059	211,100	37
	<u>Pure Premium Selection</u>				Trend =	1.020							
	3-Year Average x Latest			58									
	5-Year Average x Latest			35									
	All Year Average x Latest			43									
	Selected Pure Premium			43									

Missouri Petroleum Storage Tank Insurance Fund  
Reserve Study as of June 30, 2016  
Remedial AST  
Incurred Bornhuetter-Ferguson Method

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RY	POTENTIAL SITES	PROJECTED PURE PREM	TRENDED PURE PREM	DETRENDED PURE PREM	EXPECTED LOSSES	PERCENT IBNR	EXPECTED IBNR	INCURRED LOSSES	INDICATED ULTIMATE	PAID LOSSES	UNPAID LOSS	CASE RESERVE	ULTIMATE PURE PREM
2008	2,055	29	34	36	74,940	7.5%	5,655	51,787	57,442	51,787	5,655	-	28
2009	2,051	117	134	37	76,290	8.2%	6,241	179,761	186,002	110,661	75,341	69,100	91
2010	2,049	-	-	38	77,740	9.5%	7,412	-	7,412	-	7,412	-	4
2011	2,044	-	-	39	79,101	10.3%	8,155	-	8,155	-	8,155	-	4
2012	2,040	-	-	39	80,525	12.3%	9,871	-	9,871	-	9,871	-	5
2013	2,040	-	-	40	82,136	15.7%	12,872	-	12,872	-	12,872	-	6
2014	2,039	-	-	41	83,738	16.4%	13,693	-	13,693	-	13,693	-	7
2015	2,038	170	174	42	85,370	18.7%	15,983	195,789	211,772	53,789	157,983	142,000	104
2016	2,038	-	-	43	87,078	26.8%	23,379	-	23,379	-	23,379	-	11
TOTAL	18,394				726,919		103,261	427,337	530,597	216,237	314,361	211,100	29
	<u>Pure Premium Selection</u>				Trend =	1.020							
	3-Year Average x Latest			58									
	5-Year Average x Latest			35									
	All Year Average x Latest			43									
	Selected Pure Premium			43									